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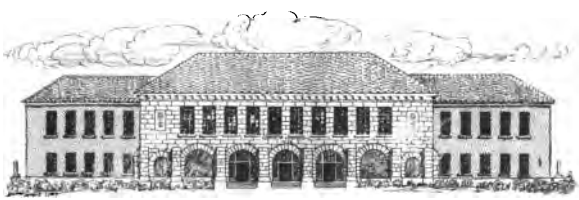

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THE GARDEN OF THE GODS—A COLORADO PARK. [*Frontispiece*

LONGMANS'

SCHOOL GEOGRAPHY

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FIFTH EDITION

REVISED

DEPARTMENT OF EDUCATION
LELAND STANFORD JUNIOR UNIVERSITY

NEW YORK
LONGMANS, GREEN, AND CO.
LONDON AND BOMBAY
1899

613227

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CHARLES J. MILLS

TROW DIRECTORY
PRINTING AND BOOKBINDING COMPANY
NEW YORK

NOTE.

The attention of teachers is called to the Questions printed at the end of this volume.

The use of these Questions is recommended as introductory or supplementary to the study of the various parts of the text-book with pupils of eleven years and over.

The knowledge of any one continent, country or city is made clearer and broader by the comparisons which the questions institute, and principles of physical geography receive new light from the numerous illustrations that they indicate.

The reasoning power and the judgment of pupils are made active by their use, and it has been found that interest in the work is greatly strengthened by such activity and by its reward of new knowledge.

To teachers not already acquainted with the book, the questions upon Scandinavia (Nos. 500 to 512 and 62, 173, etc.) are recommended as fitted to give in short space a good ensample of the general spirit of the work, if their answers be sought out in the pages of the text-book to which reference is made in the several questions.

Attention is also called to the Commercial Index on page 385 as furnishing a convenient basis for the study of special topics.

more satisfactorily than a recital of a similar series of data for each of its numerous subdivisions. Enough of the separate data, it is thought, are included in the tables on pp. 140–142, and in the paragraphs on Subdivisions and Towns. The special facts of surface, climate, productions, &c., of each State and Territory should be deduced from its position with reference to the chief features and conditions with which the general description has to do. Space is thus afforded for a more detailed general description, and for the introduction of facts and statistics showing more minutely the results of geographic conditions.

The statistical tables are intended to furnish material for instructive comparisons and deductions, which have much more

force if worked out by the pupil than if simply read and memorized.

In the paragraph on Towns it has been sought to show somewhat of the causes that promote town growth and that direct the grouping of population. The figures showing town populations are added as a simple means of indicating in a measure a place's importance and of assisting comparison.

To illustrate and accompany the text several maps have been prepared for the American edition of Longmans' New Atlas, in which are indicated the surface features mentioned, as well as the climatic conditions, the principal areas of production, lines of communication, and density of population.

Sufficiently impressed with the value of the book to adopt it for school use in New York even in its English form, the writer willingly undertook the preparation of an American edition.

He is under deep obligation to the English author for many valued criticisms, to whom also is due all credit for the plan of the book and the spirit of its execution.

C. H. LEETE.

BERLIN, 1889.

PREFACE

TO THE ENGLISH EDITION.

It is an unusual thing to prefix a long preface to an ordinary school-book, but the position which geographical teaching at present holds in this country makes it necessary to explain why a new departure is attempted, and what the nature of the new departure is. It is not long since we were told, on the authority of the Royal Geographical Society's Inspector of Geographical Education, that in this country geography is as a rule almost entirely neglected as a subject of education; and that among other reasons for this state of matters is the want of text-books fitted to aid teachers in putting the subject on a more satisfactory basis. We are also informed by the same authority that "Germany may be taken as the model which all the other Continental countries are following, as far as their special circumstances will permit;" and it may be confidently asserted that all those who have bestowed adequate attention upon this matter are satisfied that, as with regard to the general methods of geographical teaching, so with respect to text-books in particular, Germany does in fact furnish us with the models most worthy of imitation. Why it should be so is easily understood when we consider the place which geography holds in that country in the universities and in the higher education generally; but in order to appreciate fully the services which Germany has rendered to geographical education, it is necessary to take into account the length of the experience of German educationists in the working of an advanced system of education in all departments.

In a country in which there has long been ample provision both for elementary education and for all intermediate stages leading up to the universities and to the best equipped commercial and technical schools, the teachers have at least been able to learn what is possible and what is impossible in school-years. Knowing that a limited period must be turned to account for the thorough teaching of a great variety of subjects, they have learned that it is impossible for school-teaching to be both thorough and full of minute detail. They have learned, accordingly, one of the most important of all lessons in educational method—to distinguish between what is indispensable as a groundwork and what it is better to neglect if the pupils are really to be

educated, instead of having their minds overloaded, distracted, embarrassed, and perplexed.

This, then, is the particular in which the author of the present text-book has most earnestly endeavoured to guide himself by German examples, and he believes that on this feature it is impossible to lay too much stress. To those who are familiar with English text-books of geography the work now submitted to the public will hence perhaps appear more remarkable for what it omits than for what it contains.

But while this is really the case, while the author has really sought to exclude from the text-book almost all details which the pupils cannot be expected to keep permanently in mind, and can hardly attempt to keep in mind without doing injury in some way to their mental training, he has kept constantly before him the necessity for taking care that what the text-book does contain should be really foundational—should consist of what is most effective as discipline, most important to know.

In making this endeavour he has first of all sought to draw a mental picture of the different countries and regions of the world, giving due relief to what is most distinctive in each region. For this reason all countries are not treated according to a uniform plan, as if all the variety to be found on the surface of the globe could be held as adequately described by an enumeration of similar particulars under the same headings.

Secondly, while in order to make the picture of any country coherent, the relation between different features and characteristics is always kept in view, special prominence is given to the relation of cause and effect, so as to enable the pupils to realise that in geography there is something to understand as well as to commit to memory; in other words, so as to make geography a mental discipline as well as a body of instruction. Hence in selecting the particulars for notice under different headings, special attention has been given to such as illustrate general laws. With this in view, frequent references are made from the body of the book to the Introduction, which deals with the general facts of physical geography, and to other passages of the text which may be usefully compared with those from which the reference is made.

With regard to other features of this text-book, it may be noted that it is assumed throughout that no adequate teaching in geography can be given without the aid of maps. From the map alone can be gained a satisfactory knowledge of the position of different places, and from good maps it is possible, in some respects, to acquire a much more accurate idea of the character of the surface of the globe than can be gained from any description. A text-book ought, in fact, to be supplementary to an atlas and other aids to geographical education, and by no means to attempt to supersede them. Hence in the present text-book much is omitted, not as being useless, but as being out of place.

In the spelling of foreign names an attempt is made to secure an approximation to consistency, for it is obvious that to accustom boys and girls to a rational system from their school-days is the likeliest way to arrive ultimately at uniformity of practice in this respect. The rules adopted by the Council of the Royal Geographical Society, and repeated at the end of this Preface, have, therefore, been followed in the text. It need hardly be explained that no more than an approximation to consistency is thereby secured, seeing that, as stated in Rule 2, many names—including most of those which naturally find a place in a school geography—are already too familiar under spellings not in harmony with the rules laid down.

LONDON, *June* 1886.

NOTE.

In the paragraph devoted to latitude and longitude at the head of the principal sections into which the text is divided, a number of places in nearly the same latitude are always given. Those places which do not belong to the country or region with which the section deals are given in parentheses; and where they lie less than 180° to the west of the place named within such country or region, they are printed to the left of that place, otherwise to the right.

The figures given in the text are always more or less round numbers, and especially where they represent variable numbers, like populations, or indefinite numbers, like the average height of plateaux.

Towns containing 100,000 inhabitants or more are printed in capitals. Where the population exceeds 200,000 it is stated in thousands in parentheses after the name of the town. Thus, LIVERPOOL (600), means that Liverpool has, in round numbers, 600,000 inhabitants. In the American section the population is given also for smaller towns.

RULES ADOPTED BY THE COUNCIL OF THE ROYAL GEOGRAPHICAL SOCIETY AS TO THE SPELLING OF NATIVE NAMES OF PLACES.

1. No change will be made in the orthography of foreign names in countries which use Roman letters: thus Spanish, Portuguese, Dutch, &c., names will be spelt as by the respective nations.
2. Neither will any change be made in the spelling of such names in languages which are not written in Roman character as have become by long usage familiar to English readers: thus Calcutta, Cutch, Celebes, Mecca, &c., will be retained in their present form.
3. The true sound of the word as locally pronounced will be taken as the basis of the spelling.
4. An approximation, however, to the sound is alone aimed at. . . .
5. The broad feature of the system is that vowels are pronounced as in Italian, and consonants as in English.
6. One accent only is used, the acute, to denote the syllable on which stress is laid. . . .
7. Every letter is pronounced. When two vowels come together, each one is sounded, though the result, when spoken quickly, is sometimes scarcely to be distinguished from a single sound, as in *ai*, *au*, *ei*.
8. Indian names are accepted as spelt in Hunter's *Gazetteer*.

The amplification of these rules is given below :—

Letters.	Pronunciation and Remarks.	Examples.
a	*ah*, *a* as in *father*	Java, Banána, Somáli, Bari.
e	*eh*, *e* as in *benefit*	Tel-el-kebír, Oléleh, Yezo, Medina, Levúka, Peru.
i	English *e*; *i* as in *ravine*; the sound of *ee* in *beet*. Thus not *Feejee*, but	Fiji, Hindi.
o	*o* as in *mote*	Tokio.
u	long *u* as in *flute*; the sound of *oo* in *boot*. Thus, not *Zooloo*, but	Zulu, Sumatra.
	All vowels are shortened in sound by doubling the following consonant	Yarra, Tanna, Mecca, Jidda, Bonny.
	Doubling of a vowel is only necessary where there is a distinct repetition of the single sound .	Nuulúa, Oosima.
ai . . .	English *i* as in *ice*	Shanghai.
au . . .	*ow* as in *how*. Thus, not *Foochow*, but . . .	Fuchau.
ao . . .	is slightly different from above	Macao.
ei . . .	is the sound of the two Italian vowels, but is frequently slurred over, when it is scarcely to be distinguished from *ey* in English *they* . .	Beirút, Beilúl.
b	English *b*.	
c	is always soft, but is so nearly the sound of *s* that it should be seldom used. If *Calebes* were not already recognised it would be written *Selebes*.	Celebes.
ch . . .	is always soft, as in *church*	Chingchin.
d	English *d*.	
f	English *f*. *ph* should not be used for the sound of *f*. Thus, not *Haiphong*, but	Haifong, Nafa.
g	is always hard. (Soft *g* is given by *j*) . . .	Galápagos.
h	is always pronounced when inserted.	
j	English *j*. *Dj* should never be put for this sound.	Japan, Jinchuen.
k	English *k*. It should always be put for the hard *c*. Thus, not *Corea*, but	Korea.
kh . . .	The Oriental guttural	Khan.
gh . . .	is another guttural, as in the Turkish . . .	Dagh, Ghazi.
l m n . .	As in English.	
ng . . .	has two separate sounds, the one hard as in the English word *finger*, the other as in *singer*. As these two sounds are rarely employed in the same locality, no attempt is made to distinguish between them.	
p	As in English.	
q	should never be employed; *qu* is given as *kw* .	Kwangtung.
r s t v w x.	As in English	Sawákin.
y	is always a consonant, as in *yard*, and therefore should never be used as a terminal—*i* or *e* being substituted	Kikúyu.
z	English *z*	Zulu.
	Accents should not generally be used, but where there is a very decided emphatic syllable or stress, which affects the sound of the word, it should be marked by an acute accent.	Tongatábu, Galápagos, Paláwan, Sarawak.

To this statement it need only be added that, in accordance with Rule 6 and the note at the end, accents are used in this text-book in the spelling of Indian names only where they indicate stress; that in certain more or less familiar spellings (such as Punjab, Bussora) *u* has the sound which it has in *but*; and that in some Russian names the combination *zh* is used to represent the sound of *z* in *azure*.

CONTENTS.

INTRODUCTION.

PAGE

I. MATHEMATICAL GEOGRAPHY:
- Form of the Earth . . 16
- Movements of the Earth . 17
- Rotation. Latitude and Longitude . . 17
- Revolution. The Seasons 19

II. PHYSICAL GEOGRAPHY:
- Land and Water . . . 24
- Changes and Agents of Change . . . 24
- Modelling of the Land . 25
- Rivers 26
- Dissolving Action of Rain-water 29
- Springs 30
- Lakes 31
- General Result of the Action of Running Water 32
- Marine Deposits . . 32
- Emergence of Marine Deposits 33
- Folding of Strata . . 34
- Mountain-building . . 34
- Earthquakes . . . 34
- Volcanoes . . . 35
- Underground Heat . . 36
- Effect of Surface Inequalities on the Habitability of the Earth . . 37

PAGE

The Atmosphere . . . 38
- Winds 38

The Ocean 42
- Temperature . . . 43
- Movements of the Ocean . 43
  - Waves 43
  - Tides 43
  - Currents . . . 45
- Marine Life . . . 48

Climate 49
- Temperature and Rainfall 49
  - Effects of the Relations of Sea and Land . 50
  - Effects of Marine Currents . . . 51
  - Effects of Superficial Configuration . . 52
  - The Snow-line . . 53
  - Glaciers . . . 53
  - Icebergs and Ocean Ice 55
- Salubrity . . . 57

Vegetation and Animal Life 57

Man 59
- Density of Population, &c. 59
- The Growth and Position of Towns . . . 60

Table showing the Area and Population of the great Land-masses . . . 62

DESCRIPTION OF CONTINENTS AND COUNTRIES.

PAGE

AMERICA: GENERAL . . 64

NORTH AMERICA: GENERAL 68

North American Countries 84

Greenland and the Arctic Archipelago . . 84

PAGE

British America . . 84
- A. Dominion of Canada 84
- B. Newfoundland . 92
- C. Bermudas . . 92

United States . . 93

Mexico 162

Central America . . 166

West Indies . . . 166

	PAGE
SOUTH AMERICA: GENERAL	168
South American States	172
Brazil	172
Colonial Guiana	174
Venezuela	174
Colombia	175
Ecuador	176
Peru	176
Bolivia	177
Chile	177
Argentine Republic	178
Uruguay	178
Paraguay	180
EUROPE: GENERAL	181
The British Isles	189
Great Britain	195
Ireland	204
France	205
Belgium and Holland	213
Germany	220
The Alps	229
Switzerland	234
Austria-Hungary	239
The Eastern European Plain: Russia and Roumania	248
Scandinavia	256
Denmark	260
The Iberian Peninsula	261
Italy	269
The Balkan Peninsula	277
Colonial and other Possessions of European Powers	284
ASIA: GENERAL	286
I. Countries outside of the Monsoon Region	291
Siberia	291
Russian Central Asia	293
Caucasia and Armenia	294
Turkey in Asia	297
Arabia	302
Irania	303
II. The Monsoon Countries and their Dependencies	305
India	305
Ceylon	316
Indo-China	316
Eastern Archipelago	318
China	321
Korea	327
Central Asia	328
Japan	329
AFRICA: GENERAL	331
African Countries	335
Egypt	335
Independent Soudan	337
Western Mediterranean States	337
From the Senegal to the Congo	339
Congo Free State	340
Portuguese Lower Guinea	341
British South Africa	341
East and South-east Africa	343
African Islands	345
AUSTRALIA AND OCEANIA	347
Australia and the Australian Colonies: General	347
Victoria	355
New South Wales	356
Queensland	357
South Australia	357
West Australia	358
Tasmania	359
New Zealand	359
Australasian Islands (except Tasmania and New Zealand)	363
Polynesia	366
ANTARCTIC REGIONS	369
TABLE OF THE AREA AND POPULATION OF THE PRINCIPAL COUNTRIES OF THE WORLD	370
INDEX	371
COMMERCIAL INDEX	385
QUESTIONS	387
America	387
Canada	391
United States	392
South America	405
Europe	407
Asia	433
Africa	442
Australia	444
GENERAL QUESTIONS AND QUESTIONS ON THE INTRODUCTION	447

ILLUSTRATIONS.

THE GARDEN OF THE GODS—A COLORADO PARK. From a Photograph *Frontispiece*

FIG. PAGE

1, 2, 3. DIAGRAMS TO ILLUSTRATE THE SEASONS 20, 21

4. DIAGRAM SHOWING THE ALTITUDE OF THE SUN AT DIFFERENT LATITUDES AT MIDSUMMER 21

5. DIAGRAM ILLUSTRATING THE DIFFERENCE IN THE DISTRIBUTION OF THE SUN'S RAYS AT THE SUMMER AND WINTER SOLSTICES IN THE LATITUDE OF LONDON 22

6. DIAGRAM ILLUSTRATING THE INCREASE IN THE LENGTH OF THE DAY FROM SOUTH TO NORTH AT MIDSUMMER IN THE NORTHERN HEMISPHERE 23

7. SAND-DUNES, DESERT OF SAHARA. From Nachtigal's *Sahara und Sudan* 26

8. DIAGRAM TO ILLUSTRATE THE ORIGIN OF SPRINGS 30

9. DIAGRAM TO ILLUSTRATE THE FORMATION OF ARTESIAN WELLS . 31

10. THE GIANT GEYSER, YELLOWSTONE PARK. From the *Report of the Geological and Geographical Survey of the U.S.: Montana, &c.*, 1872 37

11. DIAGRAM TO ILLUSTRATE THE EFFECT OF THE ROTATION OF THE EARTH ON THE DIRECTION OF WINDS 39

12. ARCTIC ICEBERGS. From Hartwig's *Polar World* 54

13. SCENE IN A TROPICAL FOREST. From Hartwig's *Tropical World* . 56

14. A MANGROVE SWAMP. From *Unser Wissen von der Erde* . . 58

REDUCED SECTIONS ACROSS EUROPE, ASIA, AND NORTH AND SOUTH AMERICA 63

15. FRAGMENT OF AN OLD PERUVIAN WALL. From Wiener's *Pérou et Bolivie* 66

16. FOREST GROWTH ON THE UPPER SLOPES OF THE ROCKIES—A PASS. From a Photograph 74

17. FOREST SCENE, SIERRA NEVADA, U.S. After *Harper's Magazine* 76

18. A SEAL DRIVE. From Elliott's *Alaska* 79

19. A LUMBERING SCENE. From G. A. Sala's *America Revisited* . . 86

20. QUEBEC. From a Photograph 89

21. THE PLAIN OF WESTERN CANADA, NEAR CALGARY—CREE INDIANS 91

22. BOILING SPRINGS, WYOMING 99

23. THE ROYAL GORGE, DENVER AND RIO GRANDE R.R. 104

24. CLIFF-DWELLINGS. From the *Report of the U.S. Geological and Geographical Survey of Colorado and the Adjacent Territory* . 105

25. ST. LOUIS AND THE MISSISSIPPI. From Cassell's *Picturesque America* 118

26. SCENE IN THE COLORADO BASIN 119

27. PRODUCTS OF THE UNITED STATES 127

28. ELEVATED RAILWAY, NEW YORK. From Cassell's *Picturesque America* 147

29. SITKA 163

30. AN AGAVE PLANTATION. From the *Atlas Pintoresco é Histórico de los Estados Unidos Mexicanos* 165

FIG. PAGE
31. The Sierra of Santa Marta, showing the Three Vertical Zones of Vegetation. From Siever's *Sierra Nevada de Santa Marta* 169
32. Scene in the Pampas. From Hirt's *Bildertafeln* 173
33. Scene in Honda. From the *Tour du Monde* 175
34. Patagonians Hunting Guanacos and Rheas. From Muster's *Patagonians* 179
35. The Prickly Pear 185
36. Fingal's Cave. From a Photograph 197
37. Winter Scene in the Fen Country (England). From Heathcote's *Fen and Mere* 200
38. View of the Monts Dôme. From the Plates to Scrope's *Memoir on the Geology of Central France*. Reduced 206
39. Windmills for the Draining of a Polder. From *Harper's Magazine* 214
40. Diagram Illustrating the Folding of Strata in the Alps. From Peschel's *Physische Erdkunde* 229
41. Scene in the Saxon Switzerland. From *Unser Wissen von der Erde*. Reduced 230
42. The Aletsch Glacier. From a Photograph 232
43. The Lake of Geneva. From Hirt's *Bildertafeln* 236
44. Scene in the Hungarian Pusstas. After Stanford's *Europe* . 242
45. Winter Travelling in Russia 250
46. An Encampment of Lapps. From S. Tromholt's *Under the Rays of the Aurora Borealis* 258
47. The Alhambra. From De Amicis' *L'Espagne* 268
48. Front of a Venetian Palace. From Cassell's *Picturesque Europe* 274
49. A Street in Pompeii. From the Same. Reduced . . . 276
50. Mosque, Constantinople. From Lady Brassey's *Sunshine and Storm* 282
51. Athens. From the same 284
52. A Yurta. From Przhevalsky's *Mongolia* 294
53. Damascus. From the *Tour du Monde*. Reduced 300
54. Camel's Saddle. From Klunzinger's *Upper Egypt* . . . 302
55. A Persian Water-Wheel. From E. Schlagintweit's *Indien in Wort und Bild* 308
56. Ploughing with Zebus. From the same 310
57. Mosque, Delhi. From the same. Reduced 314
58. Bangkok. From Mouhot's *Siam*. Reduced 318
59. Temple of Angkor Wat. From F. Garnier's *Indo-Chine*. Reduced 320
60. Scene in a Tropical Forest. From *Unser Wissen von der Erde*. Reduced 322
61. Loess Terraces. From Richthofen's *China*. Reduced . . 324
62. Chinese Gateway. From the *Tour du Monde*. Reduced . . 327
63. Oasis in Fezzan. From Nachtigal's *Sahara und Sudan* . . 334
64. A Tembe. From Commander Cameron's *Across Africa* . . 336
65. Shoshong. From Oates's *Matabele Land* 344
66. Waterfall Gully, near Adelaide. From Harcus's *South Australia* 348
67. A Kangaroo Hunt 352
68. Natives of New Zealand (Maori). From Hochstetter's *New Zealand* 362
69. Pile-Dwellings. From the *Narrative of the Cruise of the "Challenger"* 365
70. An Atoll. From Lady Brassey's *Voyage of the "Sunbeam"* . 367

LONGMANS'

SCHOOL GEOGRAPHY.

INTRODUCTION.

GEOGRAPHY means a Description of the Earth. No description can be complete, and the shorter it is, the more necessary is it to have a guiding principle in the description. Now it can scarcely be called in question that the kind of knowledge of the earth that is of most interest and most use to us is that of the earth as the abode of man. Some knowledge of this kind is useful, however imparted; but in order that lessons in Geography should serve the purpose of genuine education, it is requisite that the learners should be taught to understand the facts that they learn so far as they can be understood. In few words, therefore, the aim of a text-book of Geography may be stated to be this: to show the relation of the surface of the earth to its population; to show where physical conditions favour and where they hinder the growth of a dense and civilised population; where hindrances have been overcome, and where favouring conditions have been counteracted; to show how physical conditions affect the daily life of people all over the globe; to show where large and where small states have been formed, and why; to show where large and important towns are situated, and what circumstances have promoted their growth. But even this is by no means a small task; to do it fully, or even, it should rather be said, to attempt to do it fully, would occupy volumes.

To have even an elementary knowledge of the relation of the surface of the earth to its inhabitants, it is necessary for various reasons to consider the earth as a whole. First, one requires to know something about the form of the earth and its position in space. This is what is usually included under the term **Mathematical Geography**; but out of the wide range of topics comprehended under this head we may select one or two as having most bearing on the main subject which we

have to keep in view. Secondly, it is needful to know something of the surface of the earth as a whole, and of the changes that take place on the surface. This is what is designated **Physical Geography.**

I. MATHEMATICAL GEOGRAPHY.

Form of the Earth.—The earth is a ball. There are several ways of proving this. (1) It is found that when we look over a level surface of large extent (such as that of the sea), objects that come in sight from a distance are always seen first at the top, the lower parts coming gradually into view as we approach them, or they us. This shows that the level surface has, in fact, a swelling which hides the lower part of a distant object whose top is visible. In other words, the surface is curved. It is found, too, that objects of the same height come into view at the same distance all round, and that shows that the curve is equal in all directions—that is, the curve of a sphere.[1] (2) It is observed that the shadow of the earth thrown by the sun on the moon in eclipses of the latter body is always round, which would not be the case unless the earth had the form of a ball. (3) It is known that different points on the surface of the earth have different points of the sky (determined with reference to the stars), exactly overhead at the same moment, and that the same distance on the surface of the earth makes almost the same angular distance between the points of the sky overhead in all parts of the earth and in all directions.

This last method of proving that the earth is round affords the means of making the most exact measurements of the form of the earth, and by this method it is found that the spherical shape is not quite perfect. There is a flattening towards two points on opposite sides, but this flattening is relatively less than we see in an orange, so that the earth may be practically treated as a round body. This enables mathematicians to draw conclusions as to all its dimensions from a single measurement. Thus, if the distance between points on its surface be measured, and means be taken to ascertain what proportion of the whole circumference that distance represents (which can be done with the aid of the stars), then we can tell not only the circumference,[2]

[1] The circle bounding the view on a level surface is called the *horizon*. In the case of the heavenly bodies, all those belonging to one-half of the sky are above the horizon at one time.

[2] The circumference of the earth is the distance round its widest part; the radius, any line from the centre to the surface; the diameter, a line passing from side to side through the centre, and hence twice the length of the radius. In round numbers, the length of the radius is 4,000 miles, the circumference accordingly nearly 25,000 miles.

but also the length of radius and diameter, the area of the entire surface, and the cubic contents.

Movements of the Earth. First Movement: Rotation.—The earth is not fixed in space. It has two movements, which have very important effects. First, there is a spinning movement of rotation, as it is called, round a line (called the **axis**) passing through the centre of the earth, and having its ends at the points towards which the surface is observed to become flattened. This line always points in the same direction, and the fact of the movement is observed with the aid of the heavenly bodies, the stars and the sun and moon. The movement is from west to east, and as it brings the people on the earth face to face with different parts of the sky, and consequently different stars, it makes it appear as if the stars were revolving from east to west round the earth, or rather round the axis pointing to a fixed spot in the sky. The spots towards which the opposite ends of the axis point are called the **poles of the heavens**, the **North Pole** and the **South Pole**, and the same names are given to the ends of the axis itself. In the case of the North Pole, there is a bright star very near the fixed point of the sky, and that star is therefore called the pole star; by looking at it on a clear night the inhabitants of the northern hemisphere can always tell the direction in which the North Pole of our earth lies.[1]

The importance of the movement of rotation to the inhabitants of the earth arises from the fact that it causes the alternation of **day and night**, by bringing at different times different parts of the earth opposite the sun.

Latitude and Longitude.—This movement of the earth has also the practical advantage of giving us two fixed points with reference to which we can determine the position of other points on the surface.

Circles are imagined as passing round the earth, and through both poles. Each of these is divided into 360 intervals called degrees, each of which subtends an angle of one degree (or $\frac{1}{90}$th of a right angle) at the centre of the earth.

A circle conceived as crossing these circles at points 90° from each pole is called the **equator**, because it divides the surface of the earth into two equal parts called the **Northern** and **Southern Hemispheres**.

[1] The most convenient way of ascertaining the direction of the North Pole is by means of the compass, the essential part of which is a magnet suspended on a pin by the middle. When so suspended, a magnet always points more or less to the north and south; but it does not point exactly in that direction, and its divergence from that direction differs in different places and at different periods. There are slight variations in the direction in the course of the day, more considerable variations in the course of the year, and still more considerable variations in the course of longer periods. In America the compass-needle now points about 9° W. of north near New York, and about 16° E. of north near San Francisco.

Other circles conceived as crossing those which pass through the poles, each at some fixed number of degrees from the equator, are called **parallels of latitude**. Each of these parallels is clearly at one uniform distance from the equator throughout, as also from any other parallel of latitude. Hence a degree of latitude would be everywhere of the same length if the earth were an exact sphere, but it is in fact slightly longer near the poles, in consequence of the flattening above referred to.

Degrees of latitude are numbered from the equator towards either pole. There are therefore 90 degrees of latitude to the north, and 90 to the south of the equator. Each degree is divided by similarly drawn circles into 60 **minutes**, and each minute into 60 **seconds**. Degrees, minutes, and seconds are respectively represented by the signs ° ′ ″.

The circles which pass through the poles are called **circles of longitude**. Half such a circle is also called a **meridian**,[1] because all places on it have noon at the same instant. It is then midnight at all places on the other half of the same circle.

Longitude is measured by degrees which denote the angles which the planes of the successive meridians make with one another. There is no natural starting-point from which to measure longitude; hence different starting-points have been chosen. That which is now generally adopted is the one that passes through the Royal Observatory at Greenwich. From it 180 degrees of longitude are counted west, and 180 east.

It thus appears that we can define the position of any spot on the earth's surface by determining its longitude and latitude. These can be ascertained by observations of the sun and stars, and the position of that place can then be accurately laid down on the map. A town which is 56° 30′ N. latitude and 17° 14′ E. longitude is at the point where the parallel and meridian named meet.

Since the meridians converge towards the poles, and are most widely separate at the equator, the distance covered by one degree of longitude diminishes continually as you follow the meridians from the equator towards the pole. Thus at the equator it is rather more than 69 miles, at latitude 45° rather less than 49 miles, at latitude 89° (one degree from the pole) only about one mile and a fifth. Hence the length of each parallel of latitude, which is divided into 360 such degrees, continually diminishes also. Now a parallel of latitude represents the daily motion of any point on it. Therefore the higher the latitude of any place the less is its velocity from the rotation of the earth.

Since the sun passes over every meridian once in twenty-four hours, it passes through 360° of longitude in that time, or 1° in four

[1] Lat. *meridies*, midday.

minutes of time. Hence noon is 4 minutes later for every degree of longitude that any place is west of Greenwich, and earlier by 4 minutes for every degree that it is east of Greenwich.

Second Motion of the Earth: Revolution.—The second motion of the earth is also detected by means of the heavenly bodies. When we observe the sun at rising or setting all through the year, we find that the stars last seen near the point of rising or first seen near the point of setting are not always the same. The sun appears to describe a circle in the heavens in the course of a year, constantly moving towards stars farther east. The path in which the sun thus appears to move is called the **ecliptic**, because it is that tract of the sky in or near which eclipses take place. We now know that it is not a movement of the sun itself, but a movement of the earth round the sun causing the latter body to come in succession opposite different parts of the sky. The earth is, in fact, only one of several bodies called **planets** which move round the sun, and form with it the **solar system**; the other planets being stars, which are observed to change their position in comparatively short periods among the other stars. The moon is an attendant on the earth or **satellite**, which moves in the same way round our globe at a distance of about 240,000 miles (sometimes greater, sometimes less). The distance of the earth from the sun also varies a little.[1] The average distance is about 93 millions of miles, or nearly 400 times that of the moon.[2]

The Seasons.—This motion of the earth round the sun is the cause of the seasons. It is so because the axis of the earth always points to the same spot in the heavens, and is not at right angles to the plane of the earth's orbit, but is inclined to that plane at an angle of 23½°. The effect of the tilt of the axis away from the perpendicular is at once apparent on comparing Figs. 1 and 2. Fig 1 shows the position of the axis in which the sun would be always overhead at the equator, and in which there would be an alternation of equal days and nights all

[1] The path or orbit in which the earth moves is not an exact circle but an ellipse, so nearly a true circle that if its precise form were drawn on paper it could scarcely be distinguished from a circle by the eye. The sun is in one of the foci of the ellipse, consequently nearer one end of it than the other: hence the variations in distance spoken of in the text. The moon has a similar orbit.

[2] Seeing that the sun and moon appear nearly equal to the eye, while the distance of the former body from the earth is so enormously greater than that of the latter, it follows that the sun must be enormously larger than the moon. The diameter of the sun is, in fact, more than a hundred times as great as that of the earth; that of the moon not much more than one-fourth as great. Within the body of the sun there would be room enough for both earth and moon at the distance by which they are actually separated from each other, and even for the moon to revolve round the earth without passing far beyond the centre of the sun, if it touched the outer edge in one part of its orbit.

over the globe all the year round. Fig. 2 shows the actual position of the axis at two opposite points of the orbit, in one of which the sun is overhead at a parallel of latitude as far as possible to the north of the equator (23½°), and in the other of which it is overhead at the corresponding parallel south of the equator. The former is the midsummer position for the northern hemisphere (June 21), the latter that of midwinter for the same hemisphere (Dec. 21). Now it will be observed that in both positions there is a circle round one pole within

FIG. 1.—(L indicates the latitude of London.)

which no light can reach the earth from the sun during an entire rotation, and at the opposite pole another circle which will remain constantly in daylight. The distance of each of these latter circles from the respective poles is again 23½°. The parallel of latitude at which the sun is directly overhead in its midsummer position for the northern hemisphere is called the **Tropic of Cancer**, that in which the same thing happens at midwinter, the **Tropic of Capricorn**, and the circles which lie at the same distance from either pole are called respectively the **Arctic**

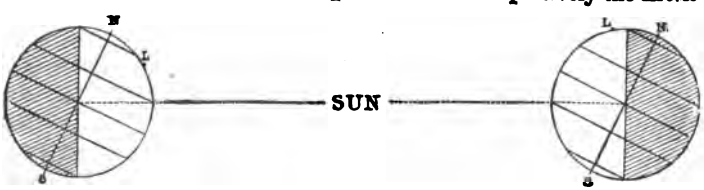


FIG. 2.—(L indicates the latitude of London.)

Circle (in the northern hemisphere) and the **Antarctic** (in the southern). Fig. 3 illustrates the gradual passage of the earth from one position to another, and shows that in passing from the midsummer to the midwinter position of the northern hemisphere, and again from the latter to the former, the earth reaches two positions, the **vernal** and **autumnal equinoxes** (March 21, September 23), in which the sun is directly overhead at the equator, and in which day and night are equal all over the world. Between the vernal and autumnal equinoxes the sun is

overhead at some point or other in the belt between the equator and the Tropic of Cancer, and the nearer it is to the latter the larger is the circle of perpetual light round the North Pole and of perpetual darkness round the South. Hence, too, within the Arctic Circle, the nearer

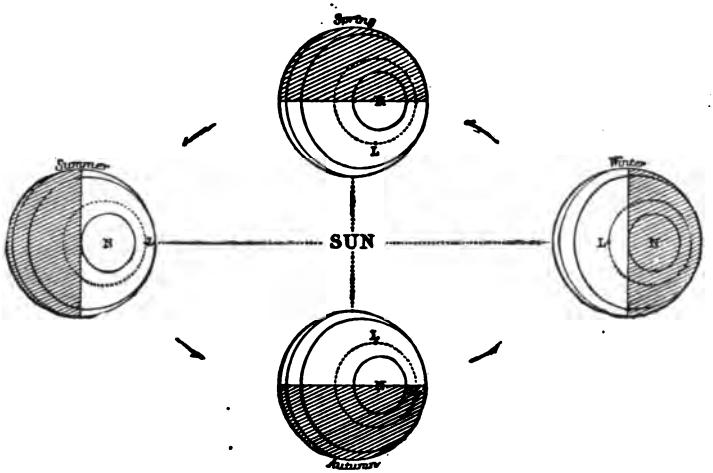


FIG. 3.—(L indicates the latitude of London.)

a place is to the North Pole the longer will be its periods of light in summer and darkness in winter. The same is true of the Antarctic Circle and the South Pole. At either pole the periods of light

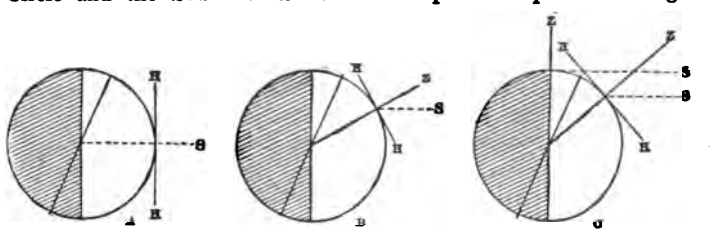


FIG. 4.—Illustrating the altitude of the sun at midsummer in the northern hemisphere, A at the Tropic of Cancer, B at the latitude of London, C at opposite points on the Arctic Circle. Z the zenith.

and darkness last about six months. The diagram thus also makes it plain that winter and summer occur at opposite periods of the year in the northern and southern hemispheres.

The areas of the earth bounded by the circles just mentioned are called zones or belts, and receive special names from the general effect

of the heat of the sun within them. The strength of the sun's rays on the surface of the earth increases with the height of the sun—first, because the higher the sun is in the sky the smaller is the surface on which its rays are expended, and, secondly, because the higher it is the less is the thickness of the atmosphere through which the rays pass, and the less heat therefore is intercepted in the passage. An examination of figs. 4 and 5 will make these facts plainer. In fig. 4 it is seen that the altitude of the sun, or the angle which the line pointing to S makes with the horizon (H), steadily diminishes from the Tropic of Cancer to the furthest limit of the Arctic Circle, on one point of which the sun is just on the horizon. Fig. 5 shows the effect of differences in the height of the sun on the distribution of an equal band of rays (*a b*) on the surface of the earth (*c d*).

From the facts above stated, it follows that the part of the earth within the tropics, where the sun is always overhead at some part, is

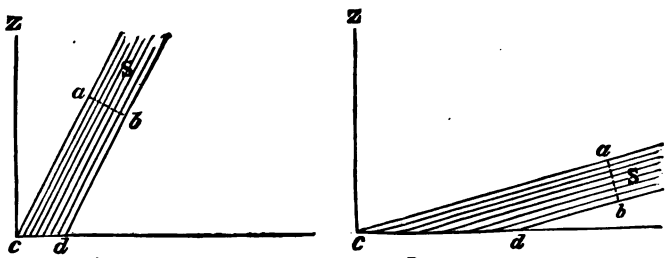


FIG. 5.—Showing the difference in the distribution of the sun's rays at London at midsummer (A), and at midwinter (B).

the hottest as a whole, and is for that reason called the **torrid zone**; the parts round the poles are called the **north and south frigid zones**, as being the coldest; and the intervening zones are called the **north and south temperate zones**. But we shall afterwards see that there are other circumstances besides the height of the sun which have an important effect on climate, and that these consequently are not true zones of climate, but merely zones of illumination.

Though the temperate zones have a regular alternation of day and night all the year round, it must be borne in mind that there is no sudden increase in the length of daylight as we cross the Arctic or Antarctic Circle. The days of summer become longer, those of winter shorter, the nearer we advance to either pole. This will be at once plain from Fig. 6, which shows the extent of daylight on the earth when the sun is in its midsummer position for the northern hemisphere (directly overhead at the Tropic of Cancer), and when it is midday at the prime meridian. It is clear that all places in latitude 50° N. are then in day-

light from rather more than 120° W., where the sun is just rising, to rather more than 120° E., where it is just setting. There are therefore more than 240° of this parallel in light, and since the earth turns through 15° in an hour, a place in latitude 50° will have more than 16 hours of daylight. Similarly, a place in latitude 20° N. will have 13½ hours of daylight. It follows that, though latitude is no sure indication of climate, places in the same latitude agree with one another at all periods of the year in the length of the day—a fact of importance with reference to the habitability and civilisation of the earth in more

FIG. 6.

ways than one. It is the long days of summer which enable grain to be grown in the short time available in one or two parts of the world near the northern limit of the temperate zone (in Norway even beyond it); and it is at least worthy of note that all the oldest civilisations both in the Old World and the New (in the Old World, those of China, India, Assyria, Egypt, Greece, Rome; in the New World, those of Mexico and Peru) rose in latitudes where the shortest day is nearly ten hours long or longer.[1]

[1] This advantage enables artificial light to be more easily dispensed with—a matter of no little consequence where artificial light is dear, or before the advance of civilisation made it cheap.

II. PHYSICAL GEOGRAPHY.

Land and Water.

The total area of the water surface of the earth is about 144½ millions of square miles, that of the land surface about 55½ millions; the ratio of the one to the other consequently about 11:4. Three-fourths of the land surface of the earth lies in the northern hemisphere; and, what is still more important, the two great land masses of the northern hemisphere, North America with Greenland and the Eurasian[1] continent, spread out in the east and west so as to leave only narrow communications with the Arctic Ocean, while the two great continents of the south, South America and Africa, taper to narrow peninsulas, leaving wide stretches of ocean between each other. The freedom of communication between the Arctic Ocean and the South is found to be still further diminished when we take the depth into consideration. Behring's Strait has an average depth of less than 60 fathoms, and a submerged bank at a depth of under 500 fathoms connects Iceland with Europe. Less is known about the depth of the Antarctic Ocean; but, so far as it has been explored, the depth would appear to decrease gradually southwards.

When eastern and western hemispheres are compared the greater proportion of land is found in the former; and when we divide the earth into two hemispheres, one containing the greatest possible amount of land and the other the same of water, it is found that Great Britain as a whole occupies nearly the centre of the former. The average depth of the ocean is enormously greater than the average height of the land. The former is estimated at about 2,000 fathoms or 12,000 feet, the latter at about 1,500 feet, so that the ocean could receive all the land of the earth above water's edge at least twenty times over. The continents must therefore be conceived as vast plateaux[2] rising to so great a height above the ocean bed that the mountains on their surface are in respect of their mass relatively insignificant.

Changes and Agents of Change.

The outlines of the continents are not permanent. There is the clearest evidence to show that sea and land are constantly, though slowly, changing places to a certain extent. On the other hand, it has now been shown to be extremely probable that the great oceans as a

[1] Eurasia is a name frequently applied to the combined continents of Europe and Asia.

[2] A plateau or table-land is a region or district with a uniformly high or moderately high level (above the sea or above the surrounding country).

whole have occupied the present great troughs from a period incalculably remote, and that the continents, though submerged now at one place, now at another, have remained similarly, as a whole, pretty much in their present positions. The margins of the sea and land have been mostly subject to change, and the whole of what may be called the unstable area (liable to be at one time sea, at another land) has been estimated at equal to about one-fourth of the entire surface of the earth. The unstable area of the ocean is generally indicated by its comparative shallowness.

Modelling of the Land.—Various agents are constantly at work reducing the harder parts of the crust of the earth[1] to small particles and even to powder, and others in carrying this crumbled material from higher to lower levels. There are three chief crumbling agents. (1) In dry countries, which are all liable to extremes of heat and cold within short periods,[2] these variations of temperature causing alternate expansion and contraction of the surface of the rocks, lead to the splitting off of scales and fragments, which become strewn at the base. In the absence of water, wind is the principal agent in carrying these fragments to still lower levels; for, though the dust may be whirled high in the air and may even settle on higher levels after a particular gust, the tendency on the whole is downwards. By this means vast areas in the interior of Africa and North America have got covered with loose matter brought from a distance of thousands of miles; in Asia great cities (Babylon and Nineveh) have been buried, and wide and deep valleys are said to have been filled by the same process.[3] In distributing the loose matter which they carry the winds act differently in different circumstances. In some cases, where they blow with constancy over vast plains or level plateaux, they build up sand-dunes or mounds of sand, with a gentle slope on the side turned towards the wind, and a steeper slope on the opposite side. Sand-dunes so formed are not fixed in position, but travel slowly along in the direction of the wind, the change in place being due to the same process as that by which they are formed. The loose sand from the gentle slope on the wind side is blown over the top and falls down the steeper slope on the other side, while fresh sand is constantly raised from the plain. In other places where the winds are less constant the loose sand may be distributed pretty equally over the surface, and hence in dry regions mountains are often seen to rise with remarkable abruptness from very level plains at their base.[4] (2) In moist countries, with a vigorous

[1] The term crust of the earth is applied to the few thousand feet beneath the surface which can be brought within the reach of our observation, and is not intended to imply that the outer part of the earth is a hard coat of armour surrounding a fluid interior.

[2] See pp. 52-3.

[3] See p. 323.

[4] See cut, p. 344.

vegetation but with little frost, the work of disintegration is principally performed by the roots of plants, which as they thicken act as powerful wedges and open the cracks even in hard rocks, and in some cases by their juices dissolve the rock; but (3) frost is probably the most powerful crumbling agent of all, and attacks the rocks all the more fiercely the more they are ramified by fissures and permeated by pores. Rain fills the cracks and enters the pores, and, as water in freezing expands with great force, large masses or small particles are burst off, and ultimately fall down through their own weight, or are easily washed off by subsequent rains. Every muddy drop that we see trickling down a hill slope after a shower of rain is a sign and an

FIG. 7.—SAND-DUNES, DESERT OF SAHARA.

illustration of the processes just described, and thus enables us to see how the valleys are widened and the mountains carved. At the bottom of the valley the action of the rain is continued by the rills and larger streams which are ultimately formed.

Rivers.—The area from which the water of a river is collected is called its basin, and the boundary of a river-basin, except where it borders the sea, is likewise the boundary of adjoining basins, and thus forms a water-parting, or line from which the water flows in different directions on opposite sides. Frequently a water-parting is the crest of a chain of mountains, but in many other cases it is only a slight swelling in a valley (Kur, Rion),[1] and it is by no means an uncommon thing for rivers to have cut a channel right across mountain chains.[2]

[1] See p. 295.

[2] See pp. 288, 306, &c.

A few instances are known in which bifurcations[1] take place where there is no proper water-parting, but part of the same channel of water flows in one direction, part in another. More frequently the same lake has outlets in different directions. Several examples of this occur in the Rocky Mountains, lakes sending waters on one side to the Pacific, on the other to the Atlantic, ocean.[2]

As an agent of change a river wears away the land at one part, and deposits material in another part. The course of a typical river is divided into three parts—an upper, a middle, and a lower course. In the upper part of its course the fall or slope of the bed is steepest, and hence the wearing or eroding action is most rapid and predominates over deposition, the energy of the action being due not only to the swiftness of the current, but still more, probably, to the gritty matter which it carries along with it. The upper part of a river thus tends to recede higher and higher up a valley; or, to use the phrase frequently employed, a river eats back its head. In the middle course of the river erosion and deposition are more equally balanced, the river eroding where its current is swiftest (on the concave or hollow side of winding banks,[3] &c.), and depositing where it is slowest (on the convex side of winding banks,[4] &c.). In the lower course of the river deposition predominates over erosion, and almost all the matter still retained by a river in suspension is deposited at the mouth, where the flow is checked by the sea or lake into which the river empties itself. Frequently from this cause there is formed at the mouth of a river a bar or submarine ridge which prevents the entrance of vessels drawing above a certain depth.

When the matter laid down at the mouth of a river rises above the surface it forms a delta. Usually a delta is traversed by several branches of the river, whence the name, which was first applied to the delta of the Nile, the outer branches of which, along with the seaboard, form a Δ (the Greek letter for D). Occasionally, however, the river remains undivided, and traverses a true delta or deposit of alluvial matter in a single stream.

[1] The most noted example is that of the Casiquiare, which belongs both to the basin of the Amazon and that of the Orinoco.

[2] The name Two Ocean Pass is given from this circumstance to a particular pass in the Yellowstone Region (lat. 44° N. 110° W.)

[3] The banks of a river are known as *right* and *left*, according as they are on the right or left hand of a person looking in the direction in which the river flows.

[4] The convex side thus tends to grow more and more outwards, the concave side to become more and more hollow, till at last the river may burst through the neck on the inner side of the convex protuberance. The Isle of Dogs, in the East End of London, is a good illustration of a deposit formed in this way, but the neck connecting it with the land is now protected by artificial embankments.

From the mode of their formation, deltas are frequently flooded, and as every flood tends to raise the river banks, while the bed of the river is also being constantly raised, it follows that the river branches in a delta almost always run along natural embankments above the level of the surrounding surface, until, perhaps, the side of an embankment is broken through and a new channel formed along another line.

Altogether, the course of a river is a scene of constant change. Only where a stream has worn for itself a deep gorge in hard rock does its channel become a permanent one, and in such places the changes are chiefly in the swiftness and depth of the current. Such gorges are specially characteristic in dry regions, where the river derives little assistance from rain, frost, and vegetation in widening its valley; and the most remarkable examples of the kind are the cañons of the Rocky Mountains in Western North America,[1] the rivers of which are fed chiefly by melting snow near the source, and have their own erosive action assisted by the rapid fall of the bed.

The action of a river is variously modified by the tributaries which it receives on both its banks. Each tributary, with the assistance of its feeders and trickling waters, tends to form a valley of its own, and when it joins the main stream it not only adds to its volume, but has other effects according to circumstances. It generally aids more or less in eating away the bank of the main stream opposite to the influx, and thus to shift the course of the latter in that direction. This effect is greatest when the tributary is impetuous, and its course at right angles to that of the main stream, as in the case of some of the tributaries of the Theiss in Hungary. But at the actual point of junction the course of a tributary hardly ever has such a direction, for, as its current is more or less checked at the confluence, alluvial matter is always laid down at the inner angle between the main stream and its feeder, so that a wedge of such deposits tends to grow longer and longer in that situation, pushing the mouth of the tributary along more or less in the direction of the course of the main stream. By the continuation of this process the tributary may ultimately get wedged off altogether, and finally enter the sea as an independent stream.

The navigation of a river, which has so great an effect on the distribution of population on its banks, depends not only on the depth of its water, but also on the rate of flow (that again on the volume of water and the directness of the course as well as on the fall or slope of the bed) and the freedom from waterfalls and shallow rapids; and the advantage of a river for navigation is often greatly reduced by the length of its windings.

[1] See pp. 102, 103, and illustration p. 119.

The Dissolving Action of Rain-water.—The action of water in wearing away the land drained by rivers is not confined to the surface. Rain-water sinks into the ground sometimes to an enormous depth, the depth depending on the thickness of porous rocks. In doing so it may become muddy from the washing away of solid particles, just as when it trickles down a hill slope, but it exercises a much more powerful action in many cases in another way. There are many substances which rain-water can dissolve,[1] as water dissolves salt or sugar, causing them to disappear wholly from sight. Various soluble salts are always present in the ground, and hence rivers always contain a certain proportion of salt, though seldom enough to impart a salt taste. Carbonate of lime, of which chalk, limestone, and marble are three different forms, and which, accordingly, is one of the most widely diffused substances in nature, is easily acted on by rain-water in this way; where such rocks abound, **caves** are apt to be formed by the continual action of rain-water filtering in through pores and fissures,[2] and further consequences ensue from this process. Sometimes the hollows in limestone rock and the openings into them are so enlarged that considerable streams may precipitate themselves into them and continue their course for a time underground. Underground rivers are consequently a frequent characteristic of limestone regions.[3] Generally these rivers re-emerge at some point on the surface of the land, but sometimes they find their outlet under the sea. Sometimes the overlying crust of the earth is left by the process of cave-making without support and falls in, so that basin-shaped hollows take the place of subterranean caves.[4] Very frequently floor and roof in a cave are connected by a magnificent array of picturesque or fantastic pillars, which are themselves the result of the process by which the caves are made. For the process of cave-making is a slow one. It is carried on by the water, drop by drop. Each drop dissolves a little of the limestone; but where the percolation of the water is very slow, each drop as it hangs on the roof of the cave partly evaporates, and the carbonate of lime that had been dissolved in the evaporated water is left as a thin crust on the roof. Subsequent drops enlarge and elongate this crust till what is called a **stalactite**[5] is formed. The same process goes on beneath on the floor of the cave where the drop falls, and so, in course of time, a column of carbonate of lime, to which the name of **stalagmite** is given, is built up from the floor, and the meeting of the two forms a pillar, which the continuation of the process thickens and models.

[1] This dissolving power rain-water owes chiefly to the fact that it always contains a certain proportion of carbonic acid derived from the atmosphere.

[2] See p. 235, *n.* 2.

[3] See p. 298 (middle of page), and compare p. 299 (under Jordan).

[4] See p. 246.

[5] From the Greek *stalaktos*, 'dropping' or 'trickling.'

Springs.—Even where the rocks are less easily acted on than limestone and its allies, the action of underground water is important. It is to this water that springs owe their origin. Deep as water may sink in certain kinds of rock, whether porous or traversed by numerous inter-ramifying fissures, it is stopped by other kinds which are practically impermeable to water. So stopped, it creeps along the junction between the permeable and impermeable rock till it finds an issue on the surface of the ground in the form of a spring, which drains so much of the porous rock as lies above its own level (Fig. 8). Such being their origin, springs always contain some substances in solution derived from the rocks through which the water that feeds them has percolated. Hence many are known as mineral springs, and among these not a few have a repute on account of their medicinal action. Where the water comes from a great depth below the surface it is always warm,[1] and,

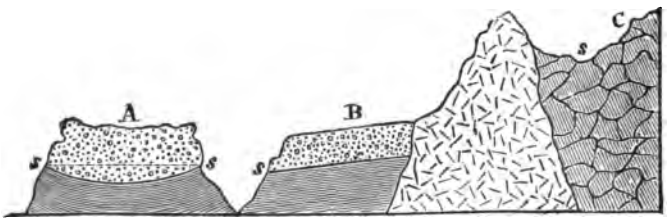


FIG. 8.—A, B, porous rocks; C, a rock with inter-ramifying fissures; s, s, springs.

as warm water is capable of dissolving many substances which cold water (even rain-water) cannot dissolve, hot springs are always richer in dissolved minerals, and more frequently than cold ones have a medicinal reputation. One widely diffused substance, silica,[2] is as readily dissolved by very hot underground water as carbonate of lime is by cold, and hence deposits of silica (known as **siliceous sinter**) are very often found round the mouths of hot springs.

In many parts of the world springs can be made artificially by deep borings. These are called **Artesian Wells** from having first been made in Europe[3] in the French province of Artois. A peculiar form and structure of ground are required to render the sinking of such wells possible. (1) The ground must be hollow, so that the mouth of the well is lower than the surface where the water destined to feed it is collected. (2) A bed of porous rock must form a similar hollow beneath the surface, emerging at the surface only at certain places where the rain-water can soak into it. (3) Above and below this porous bed must be beds of impermeable rock, the lower bed to keep the water from

[1] See p. 86. [2] A substance of which quartz and sand are different forms.
[3] Long previously elsewhere.

sinking still deeper and so escaping, the upper to prevent it from oozing to the surface at all parts and so forming a marsh. When these conditions are fulfilled a boring in the hollow down to the porous

FIG. 9.—*a*, artesian well; *b*, *b*, impermeable strata; *c*, *c*, porous stratum; *d*, *d*, collecting surfaces.

bed will enable the water to well forth at the top (Fig. 9). Such borings are often of great importance in arid countries.[1]

Lakes.—The action of running water is frequently modified by the presence of lakes. Lakes may occur either at the head of a river, when they are fed by a number of small streams, none of which can be identified with that which forms its outlet, by springs, or by rains and trickling water; or they may occur in the course of a river (forming expansions in its bed); or they may be the final recipients of the water of one or more rivers having themselves no outlet; or they may stand quite isolated, fed by rains and springs and kept within limits by evaporation. The last two classes of lakes are nearly always salt, from the gradual accumulation of the salt conveyed by the rivers or other waters that feed them. Lakes with underground outlets (Zirknitz[2]) are only apparent exceptions.[3]

All lakes, whether fresh or salt, tend to be filled up and disappear in course of ages. Where they are, as it were, expansions in the bed of a river, their obliteration goes on rapidly by a double process. At the upper end of the lake the river deposits almost all its sediment in the still water which checks its flow on its entry;[4] at the lower end it constantly saws its outlet deeper, and thus keeps reducing the level of the entire lake. So long, however, as lakes exist, they have an important effect on the lower course of the stream, an effect which often has a great influence on the habitability of the country on its banks. They serve to regulate the volume of the river below, gradually rising in level when floods swell the upper reaches, and thus making the flow of the lower parts of the river more constant, and protecting the neighbouring country from inundation.[5]

[1] See p. 338. [2] See p. 246, *n.* 2.

[3] Lob Nor, in Eastern Turkestan, is a peculiar case. Its waters are fresh, though there is no outlet, but it is described by Przhevalsky as in reality merely the expansion of a river, and as flowing on like a river till its waters evaporate, its salts then forming an incrustation on the surface of the ground.

[4] Lakes are thus filterers of rivers.

[5] The Aar, in Switzerland, has been diverted by an artificial channel into the Lake of Bienne, in order that the lake may serve for this purpose.

In the case of salt lakes the process of obliteration is a more gradual one. The sediment carried into them by the feeders slowly raises the level of the lake, causes it to have a smaller depth but a greater extent of surface. The extension of the surface is, however, retarded by the fact that evaporation is accelerated when the area of the surface is enlarged. But it is only a retardation. The level of the lake tends to rise, the surface to spread, until in the end one of two results is bound to happen. Either the level is so much raised that an outlet is formed to the sea, or the surface becomes so extended that the lake dries up from the rapidity of evaporation. Hence there are large areas of the earth which are constantly dry at least in summer, but have the surface strongly impregnated with salt.[1]

From this account the conclusion may be drawn that all lakes must be regarded as recent formations in the history of the earth, and the hollows which they fill are due to various changes in the crust.

General Result of the Action of Water.—Since, then, it is the destiny of lakes to be filled up and disappear, and of matter at higher levels to be carried down to lower levels, it follows that the ultimate tendency of running water is to carry all the higher land of the earth into the sea. But in doing so it acts unequally—here eating away the land with great energy, there enfeebled or even temporarily checked in its action; and hence the general effect of the process is in the first instance to exaggerate the inequalities on the surface of the earth instead of removing them. Table-lands are thus sculptured into mountains and valleys, and mountain chains and peaks are rendered more and more rugged and precipitous. Many of the mountains of the world are due as such to no other cause.

Marine Deposits.—The sea, being the ultimate receptacle of the matters worn away from the land, sorts them out according to their weight and fineness, and by means of its waves, tides, and currents, spreads them out in vast flat sheets, layers, or strata. The heavier matters sink to the bottom first and form sands, which ultimately get consolidated into sandstones. The finer matters are carried farther out, but sink in the end likewise, forming a muddy bottom which ultimately gets hardened into fine-grained rocks like shale, mudstone, or slate.[2] The soluble substances are carried out farthest of all, and amongst them the carbonate of lime is transported in great quantity into deep waters, there to

> Suffer a sea change
> Into something rich and strange.

[1] Changes in climate and physical features may modify these processes.

[2] All these rocks may be described as hardened mud; but while mudstones are compact and homogeneous, shales easily split into thin layers parallel to the plane of stratification, and slates can be split into leaves more or less inclined to that plane.

Myriads of living creatures take hold of it, and 'by some strange alchemy' build it up into an infinite variety of beautiful skeletons, which during the life of the animals serve as their means of support and protection, and after their death sink to the bottom and form the material out of which new limestones arise similar to those from which the substance was originally derived.[1]

The insoluble substances derived from the land are never carried far out to sea. Even the largest rivers and strongest currents never transport them farther than 200 or 300 miles from the shore. If the sea-bed keeps stable the shore-line is gradually extended seawards, where deposits are abundant, as at the mouths of rivers and on coasts where currents are arrested. But if the sea-bed happen to be sinking the deposits grow thicker and thicker in the same place, and changes in depth or in the currents may lead to deposits of one kind being laid down immediately above those of another kind. Thus are built up whole series of strata, limestones, sandstones, shales, &c., and from the strata so formed the land is renewed.

Emergence of Marine Deposits.—The changes of level already referred to raise sea-formed strata in many cases high into the air. This has taken place at different times in the world's history, and the strata themselves often furnish an indication of the period when this has taken place, or, if not that, at least of the relative order in which they have themselves been formed. They do so by means of the fossils which they enclose. Fossils are remains of living things, whether animals or plants (generally animals), which have been preserved in a recognisable form from the time when they got imbedded in the rocks as these were forming; and an examination of these remains collected in regions where we can tell the order in which strata have been laid down from the order in which they still lie one above the other, has brought to light the fact that in the course of ages there has been a gradual change in the character of the living things on the globe, and hence in the fossils. By the character of the fossils geologists are thus able to tell the relative age of the rocks in which they are found, and

[1] Of the animals which acquire skeletons of carbonate of lime the most important geographically are minute creatures called *coral polyps*, the skeletons of which have formed reefs and barriers in the neighbourhood of coasts in warm seas, and an almost innumerable crowd of small islands in mid-ocean. When wholly composed of coral remains these islands are generally ring-shaped, and are then known as *atolls*. They are necessarily always flat and low, the animals being unable to live out of water. The part of the island above the surface is due to the arrest of drifting matter, by the coral beneath the surface, the heaping of broken fragments of coral on the top of the reefs by the waves, and the subsequent accumulation of vegetable remains—the plant-life itself being either brought originally with drifted material, or derived from seeds dropped by birds. See p. 366, and cut, p. 367.

hence we may speak of rocks being in a geological sense older and newer.[1]

Folding of Strata.—Though originally, as a rule, spread out level at the sea-bottom, the strata are scarcely ever found to be level, or nearly level, when raised to form dry land. They are folded and crumpled as layers of cloth might be when squeezed from side to side while at the same time under pressure from above. There can be no doubt that the rocks forming the crust of the earth have been subjected to a similar squeezing, a squeezing of such tremendous force as to bend immense thicknesses of the hardest rocks into greater or smaller wrinkles, sometimes forming gentle undulations, sometimes close-set folds.[2]

Mountain-building.—Along certain lines the crust of the earth seems to have been peculiarly weak, so as to be less able than other parts to resist the enormous upward pressure resulting from this lateral squeezing. In such situations great masses of matter have been forced high into the air, forming mountain chains like the Alps, Himalayas, and Andes. The formation of deep seas like the Mediterranean seems to have been part of the same process, a great hollow corresponding to a great swelling. The greatness of the force exercised during this process is evidenced by the abruptness of the folds of the strata, which often in mountainous regions stand upright, and sometimes are tilted over so that older rocks come to lie above newer.

But, tremendous as the forces are which give rise to upheavals of this kind, the process is generally an extremely slow one, a striking proof of which is furnished by the fact already mentioned,[3] that rivers often cut right across mountain chains, for there is often the clearest evidence to show that the rivers were there before the mountains, and have deepened their beds as the mountains rose, forming themselves the gorges by which the chains are broken.

Earthquakes.—There is strong reason to believe that earthquakes also are, in many cases, among the consequences of the enormous lateral pressure which crumples the strata of the earth's crust and builds up mountain chains. We can imagine that the snapping of a part of the crust deep below the surface in consequence of the intense strain which that pressure causes is the origin of the shock which sometimes destroys whole cities along with thousands of human beings.

Many earthquakes are, however, due to volcanic outbursts, and still more, in all probability, to subterranean movements of the same nature as those which lead to such outbursts. The localities in which earthquakes most frequently occur are such as might be expected in

[1] Vegetable remains, found chiefly among a particular series of older rocks, forming the Carboniferous system, have given rise through chemical and other changes to *coal*. [2] See Fig. 40, p. 229. [3] See p. 26.

accordance with these two surmises as to their cause; for these are, in the first place, regions where active volcanoes are most abundant (see next paragraphs); and, secondly, mountainous countries, and above all the neighbourhood of mountain chains. Besides the shores of the Pacific Ocean and the islands of the Eastern Archipelago, the parts of the world most frequently visited by earthquakes are the Mediterranean Peninsulas (including Asia Minor), the Caucasus, Elburz, Himalayas, Tian-Shan, and Appalachian Mountains and the districts in their vicinity.

Minor shocks may be due to various other causes, and careful observations with instruments in different parts of the world have made it likely that the whole surface of the earth is in a constant state of tremor.

Volcanoes.—All mountains are not due to the processes already described, nor are all parts of the earth's crust composed of rocks originally laid down in water. Volcanoes are built up of material ejected from beneath the surface of the earth, and their generally conical form is due to the mode in which that matter has been deposited round the opening from which it is ejected (the **crater**).[1] The matter thrown out is sometimes molten (**lava**), and pours forth in a glowing stream, which may flow to a distance of scores of miles. Sometimes the molten matter is sent forth with such violence as to be torn into spray, which solidifies in the air into dust, mingled with larger and smaller rounded[2] stones (**bombs** and **lapilli**). Sometimes the matter ejected is solid, even when blown from the crater, but there is always gas along with the vapour of water present, and occasionally there is nothing else. In former geological ages wide sheets of molten lava appear to have issued in certain places from cracks in the earth's crust, and to have covered extensive plains. Solidified matter (previously molten) filling a fissure in the crust is known as a **dyke**.

Many volcanoes are **extinct**, and have not undergone eruption in historical times, and some such volcanoes are remarkable for still preserving their characteristic form with well-marked craters (Auvergne, Eifel). Others are **dormant**, not having undergone eruption since a remote period. Others are said to be **active**, being still subject to eruption from time to time.[3] Almost all active volcanoes are situated

[1] Greek, 'a cup.' Usually there are many secondary craters in a volcano in addition to the principal one. [2] The rounded form due to whirling in the air.

[3] The number of active volcanoes distributed over the globe is upwards of 300, but it is impossible to state the precise number, since it cannot always be determined whether a volcano is to be considered active or dormant, or even extinct. Those which are undoubtedly active are mainly scattered round the Pacific, on the west coast of America (with a wide gap in temperate North America) in the

near the sea, and this fact would appear to have a great deal to do with the occurrence of volcanic outbursts. It is believed that such outbursts may be due in some, if not in all, cases to the sudden conversion into steam of water that has filtered through porous rocks to heated matter deep down in the crust of the earth.

Underground Heat.—In any case the existence of volcanoes is a proof of the presence of heated matter below the earth's surface. But it is not the only proof. Everywhere it is found that when we descend below a certain depth[1] at which the temperature is constant all the year round, the temperature increases the deeper we go. The rate varies at different places, and even for the same place at different depths, but on an average is estimated at about 1° Fahr. for every forty-five feet of descent. Hot springs are one of the effects of this internal heat of the earth. **Geysers**, or hot springs liable to periodic eruptions, during which water is sometimes shot hundreds of feet into the air, occur in Iceland, Western North America, and New Zealand. In the last-mentioned region they are known in the Maori tongue as *puia*.

Both the geysers and the other hot springs of New Zealand are in the North Island, where they abound on the line of volcanic action which passes from Mount Ruapehu through Lake Taupo to the Bay of Plenty (see pp 360, 361). Here also are volcanoes, which throw up mud, and have been known to do so in greater quantity than any similar volcanoes in any other part of the world. Near **Lakes Rotorua** and **Tarawera**, about 30 miles from the Bay of Plenty, such springs, geysers, and mud volcanoes are particularly numerous, and the small Lake Rotomahana, to the south of Lake Tarawera, used to be visited by travellers from all parts of the world on account of the beautiful pink and white terraces of siliceous sinter[2] which had been formed by hot springs on its shores; but in the winter of 1886 these were wholly destroyed by a tremendous volcanic outburst. An adjoining volcanic hill named Tarawera, which had never before been known to break forth in eruption, was then swept away by a volcanic explosion which overwhelmed all the neighbourhood.

The eruptions of geysers are probably due to sudden alterations in pressure in a deep column of very hot water. The boiling-point of water is higher the greater the pressure, and the water at the bottom of the crater of a geyser may be at a very much higher temperature than that of boiling water under the pressure of the atmosphere, and yet not high enough for the water to boil under the superadded weight of the column above. If, however, through the increase of heat, the

north-east of Asia, and on the islands in the east and south-east of Asia. Many islands in mid-ocean are of volcanic origin, and many volcanoes are submarine.

[1] Varying in different places according to climate.

[2] See p. 30.

column once begins to boil over, the pressure is immediately reduced, and the boiling then goes on with violence for a longer or shorter period.

Effect of Surface Inequalities on the Habitability of the Earth.—Mountains and plateaux act in some respects favourably, in others unfavourably, in the development of population.

(1) Long mountain chains interrupt communication between the people on different sides more or less, and the interruption is the more serious the denser the populations that are thus separated. From this point of view the height, slope, and number of passes across mountains are of much more importance than the height and number of the peaks. (2) Mountain slopes are difficult of cultivation, and more difficult in proportion to the steepness. Cattle-rearing is almost the only agricultural industry that can be carried on high up on mountain sides. (3) On the other hand, in regions that require irrigation the lower slopes of hills and mountains present one peculiar advantage for agriculture, inasmuch as they can be cut out into level terraces, to which the fertilising water can be led down from stage to stage. In warm countries this is a very common mode of cultivation. (4) Mountains and plateaux have various important effects on climate, which will afterwards be explained.[1] (5) Mountains and highlands generally, in virtue of the

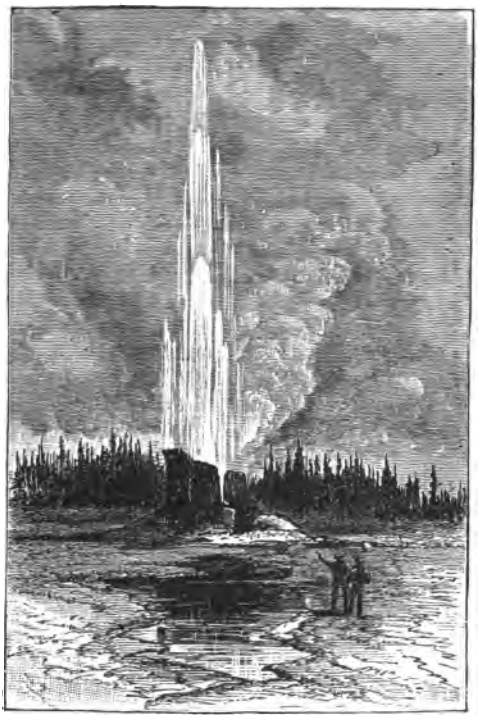


FIG. 10.—THE GIANT GEYSER, YELLOWSTONE PARK.

[1] See pp. 52, 263.

processes already described, are the sources of soil for the plains lying at their feet; hence the fertility of the valleys of the Po, Ganges, and many others. (6) Through the contortions to which mountains owe their rise a great variety of strata, old and new, are brought to the surface, and with these a great variety of minerals,[1] the working of which employs a large population.

The Atmosphere.

The atmosphere is a mixture of gases[2] forming an envelope round the globe. Its height above the surface cannot be definitely stated, for the gases of which it is composed gradually become rarer and rarer the greater the elevation. The greater density of the lower strata is a consequence of the attraction of the earth, which gives weight to every substance on the earth's surface, though in the case of the atmosphere this weight cannot be felt by us, because it presses equally on all sides. The pressure on one side of the hand exactly balances that on the other side. The weight or pressure can, however, be made observable in various ways. The commonest way is by means of a tube closed at one end, exhausted of air and inverted over a basin of mercury. The mercury then ascends the tube, in consequence of the pressure of the atmosphere outside, unbalanced by any corresponding pressure inside. It rises till the weight of the column of mercury is exactly equal to the weight or pressure of a column of air of the same diameter. A tube like this, with a scale marked on it to show the height to which the mercury rises, is called a **barometer**. The average height at sea-level is nearly thirty inches.

The differences in the height to which the mercury rises in a barometer at different levels above the surface of the earth are sometimes taken advantage of to measure the elevation of mountains and plateaux; but such measurements are not very trustworthy because the height of the barometer, or in other words, the pressure of the atmosphere, varies at different times at the same place, as it varies at different places at the same level.

Winds.—Of the latter differences, which are of the highest importance in geography as giving rise to winds, the great cause is the heat of the sun. Heat expands or rarefies the air, and hence causes the pressure to be less, while cold condenses the air and increases the pressure. But as water always tends to assume the same level, air always tends to acquire the same pressure at the same level. This it does by flowing from the place where the pressure is high to where it is low, and hence from where it is condensed to where it is rarefied. The most familiar illustration of this is presented by land and sea breezes.

[1] See p. 263.

[2] The principal being nitrogen and oxygen.

These are due to the fact that the land is more rapidly heated by day, more quickly cooled by night, than the sea.[1] Hence by day it is warmer on land than at sea, and, if the weather is otherwise calm, a sea-breeze blows on the coast by day. For the opposite reason, a land breeze blows at night.

Under the same law there blow over a great part of the ocean constant winds which, directly and indirectly, are of the highest importance for the climate of the whole earth. These are called the trade-winds, which are winds blowing more or less from the north and south towards a belt near the equator, where the amount of heat and consequent rarefaction is greatest, and where calms and variable winds prevail. The position of the dividing belt between these two winds varies from

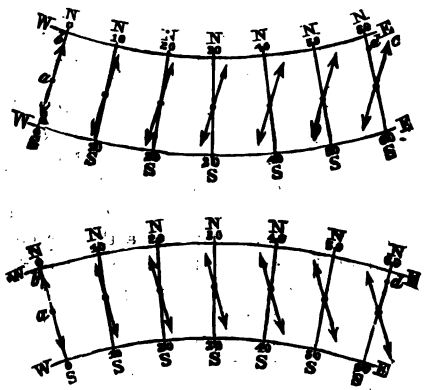


FIG. 11.

season to season through about 8° in the Atlantic, 5° in the Pacific Ocean, being farther north when the sun is high north of the equator, farther south when it is high south of the equator. In the Atlantic and Pacific Oceans they blow on each side of the dividing belt over a breadth varying from 20° to 25°. In the Indian Ocean only the south trade-wind prevails.

If the direction of these winds depended solely on the difference of temperature in tropical and extra-tropical seas it would be exactly north to south in the northern hemisphere, south to north in the southern, but there are three causes which alter, or seem to alter, their direction. Two of these are direct consequences of the rotation of the earth.

The first and most important of these effects is illustrated by

[1] See p. 43, under *Temperature*.

Fig. 11, in which the arrows represent the vibrations of a pendulum continued uniformly in the same direction while the earth is turning on its axis, the upper part of the figure showing how the motion of the pendulum, which began as a due north and south vibration in long. 0° comes to cross the direction of the meridian in the northern hemisphere, as the rotation of the earth brings the position at which the motion commenced into those positions which were then occupied by the meridians 10°, 20°, &c.; the lower part of the figure shows similar effects in the southern hemisphere. By causing a pendulum to vibrate in this manner a French physicist named Foucault made the effect of the rotation of the earth visible. So also if the direction of motion of a current of air at starting in lat. 30° S. is due north, then in long. 0° (Fig. 11, lower part of fig.) it is represented by the arrow pointing northwards upon that meridian; but if, while keeping the same direction, the current of air reaches lat. 10° S., when the earth has rotated from 0° to 60°, the original direction will be represented by the arrow pointing to *c*; the point moving from *a* to *b* will arrive at *c* instead of *d*; the wind will have become more or less south-east. Thus all winds of the northern hemisphere tend to appear as if deflected to the right, those on the southern hemisphere for similar reasons to the left. Secondly, the movement of rotation along parallel 30° is slower than along parallel 10°; hence the air coming from 30° tends to lag behind at 10°, and so become more easterly. Thirdly, in the case of the Atlantic trade-winds, the greater rarefaction on the land tends to suck in the air from the opposite region of the ocean, and this increases still further the easterly element of the direction of the trade-winds in the neighbourhood of South America.

The winds which constantly pour in from the outer margin of the trade-wind belts must necessarily be balanced by others flowing outwards. Near the dividing belt this outward flow, constituting the anti-trades, takes place at an elevation too great for us to have any direct evidence of it, but the signs of it become more and more frequent the farther we advance towards the outer margin of the trade-winds. Within twelve or fifteen degrees of the equator occasional evidence of it is furnished by volcanic dust being projected up to the height at which this outward wind is blowing, and hence falling to the east instead of the west of the volcano. Nearer the margin high clouds can sometimes be seen moving eastwards; and on mountains, such as Teneriffe, in lat. 28° N., there is a constant south-west wind, which blows, however, only at the top in the height of summer, descending lower and lower as the winter advances and the margin of the trade-wind belt recedes to the south.

This shows that the anti-trades sink in elevation as they recede

from the place of their origin. The air which they carry cannot all advance farther and farther polewards, for it is obvious that, as the intervals between the degrees of longitude grow narrower in that direction, there cannot be room round the poles for the air that starts from the equatorial belt. A struggle hence takes place among the particles of air, and this leads to a condensation of the air about the margin of the trade-wind zone, where the barometer generally indicates a higher pressure than almost anywhere else on the globe. Thence accordingly the wind flows at the surface of the earth equator-wards and polewards, with the normal apparent deflection. Hence south-west winds (anti-trades) prevail throughout the year on the west coasts of Europe and the corresponding coasts of North America; but in the northern hemisphere, owing to the frequent interchange of sea and land, the winds of the temperate zone are extremely variable. In the southern hemisphere, on the other hand, there is little land beyond 40° S., and hence the anti-trades blow there with more constancy, and are known to seamen, from the latitudes in which they prevail, as 'the Roaring Forties.'

A certain constancy can be observed even in the variable winds of the northern hemisphere. Normally they either blow from all sides inwards to a centre of low air pressure, or outwards on all sides from a centre of high pressure, In the former case they form what is called a **cyclone**,[1] because the isobars or lines connecting the places having an equal pressure outside the centre of such a wind-system are circular or nearly circular in shape. In the latter case they constitute a wind-system known as an **anti-cyclone**. The direction in which winds blow spirally[2] inwards in a cyclone is (in the northern hemisphere) opposite to that of the movements of the hands of a watch lying face upwards, in an anti-cyclone the opposite. The position of an anti-cyclone is usually pretty constant for days, or even weeks together, but that of a cyclone is constantly changing, as the centre of low pressure is always shifting, generally in a more or less easterly direction. Cyclones vary greatly in dimensions, but most commonly they are between 1000 and 2000 miles in diameter, so that one that extended only from the Shetland Islands to the middle of France would be a small one. In low latitudes cyclones are much rarer than nearer the poles, but when they do occur are generally smaller in size and more violent in character. They constitute in fact the revolving storms known in different regions as **hurricanes** and **typhoons**, as well as cyclones. In the seas where they occur these are most prevalent at certain seasons of the year. The hurricanes of the West Indies and the North

[1] From Gr. *kyklos*, a circle.

[2] Not directly, because they are deflected as explained on p. 40.

American coast, and the typhoons of the China Sea and the coasts of Japan, occur chiefly from July to October, and above all in August and September; the cyclones of the Malabar coast and the Bay of Bengal, chiefly in April and May, October and November; those of the South Indian Ocean, and in the South Pacific Ocean between the Australian coast and the Low Archipelago, chiefly from December to March or April. In both hemispheres accordingly they take place mostly in the summer months, except in the Indian seas, where they are most prevalent about the change of the monsoons (see next paragraph). In the southern hemisphere the direction of rotation in a cyclonic storm is opposite to that experienced in the northern hemisphere.

In many parts of the world, sea and land breezes take place on a large scale, alternating not by day and night, but from season to season. The region in which such alternating winds prevail most extensively and in the most marked degree is South-Eastern Asia, including the Eastern Archipelago and the northern part of Australia, throughout which the winds are known as **monsoons**, from the Arabic word for seasons. The contrast between the different seasons is most marked in the area to the south of about lat. 25° N. (India, Indo-China, and Southern China, as well as Northern Australia and the Islands), where sea breezes (south-westerly, southerly, south-easterly) blow more or less steadily for half the year, while the sun is in the northern hemisphere, and the rarefaction greatest over the land, and land breezes during the rest of the year. Even as high as lat. 60° N. the seasonal changes are indicated by the predominance of sea and land breezes, in summer and winter respectively. South of the equator the monsoon winds are governed chiefly by the rarefaction and condensation in the interior of Australia. Hence the sea breeze (in the Eastern Archipelago and the greater part of Northern Australia a north-west wind, in the north-east of Australia a north-east wind) occurs while the sun stands high in the southern hemisphere.

Seasonal winds of the same nature, though less constant, are observed in other parts of the world, as to the north-east of the Gulf of Mexico and of the Black Sea.[1]

The Ocean.

The ocean is a vast body of salt water, the volume of which relatively to the land surface of the earth has already been indicated. The saltness varies from thirty-three to thirty-eight parts in a thousand, being greatest in the trade-wind area and in inland seas like the Mediterranean and the Red Sea, where evaporation is rapid and the

[1] See pp. 72, 295, 344.

influx of fresh water slight. In other inland seas, where opposite conditions prevail, the saltness is much less than that of the ocean. In some parts of the Baltic it is only about seven parts in a thousand.

Temperature.—The temperature of the ocean generally, as compared with that of the land, is remarkable for its uniformity. At the surface the mean daily range, or difference between the highest and lowest temperature within a single day of twenty-four hours, is not more than 1° F. in deep seas, 4° F. in shallow waters. The annual range exhibits a corresponding equability, although, of course, the extremes in this case are wider apart. There are two causes of this very important geographical fact. (1) Water requires a greater amount of heat to raise its temperature one degree than any other substance, a much greater amount than is required by the solid substances composing the land surface of the earth. (2) The movements which go on unceasingly in the waters of the ocean, and of which some account will be given presently, have the effect of distributing and equalising the temperature. Another consequence of the slowness with which water is heated (and the like slowness with which it is cooled) is that the hottest and coldest months for the ocean (August and February) occur a month later than the corresponding months of the land surface of the earth, except in those maritime places where the temperature is governed in a marked degree by marine influences.

Movements of the Ocean: Waves.—The movements of the ocean are all of great importance with relation to the inhabitants of the earth. The most obvious of these consists in wind waves—sometimes only a gentle rocking and lapping, at other times terrible in their violence. Great difficulty exists in measuring the height of waves. The highest storm waves are said to measure forty-four to forty-eight feet in height, the average storm wave about thirty feet. The distance from crest to crest in the case of great waves is said to vary from 500 feet to half a mile in extreme cases. With regard to the force of the waves, it is recorded that at the Skerryvore Lighthouse, off the west coast of Scotland, a mass of rock five and a half tons in weight has been hurled by a wave to a height of seventy-two feet above the surface of the sea, and a mass thirteen and a half tons in weight dislodged from a cliff at a height of seventy-four feet. Such instances convey a good idea of the power of the waves in wearing away an exposed coast.

Tides.—The tides, which consist in a gradual rise and fall in the level of the ocean completed twice in about twenty-five hours, are practically important in relation to navigation, and more particularly in relation to the navigation of narrow seas and river mouths. In narrow channels the tides are not merely a rise and fall of the level, but also a backward and forward flow or current, and as such assist in

propelling craft now up and now down a river; and, moreover, have in some cases an important effect in preventing the formation of river bars, since they scour the lower part of the river bed and wash the sediment far out to sea, or cause it to be deposited chiefly on the river banks and not in mid-channel. But as a rise and fall also the tides are of great consequence in relation to shipping, as enabling vessels of large burden to ascend the estuaries[1] of rivers to a considerable distance, so as to facilitate the growth of great seaports in perfectly sheltered positions easily accessible on the land side as well as by sea. Great Britain and the shores of the North Sea are peculiarly favoured in respect of tidal influences, the tide rising in these waters to an exceptional height, as will be understood when the rise and fall of the tide is explained.

The tides are due to the attraction of the sun and moon on the earth, but chiefly that of the moon. If it were the whole amount of attraction exercised by the sun or moon on the earth that gave rise to the tides, then the influence of the former would be by far the greater; but it is not the whole amount of the attraction in either case that has the effect in question, but the difference between the attraction of either upon the solid (or at least rigid) globe and that exercised on the movable body of waters on its surface. The waters swell up in a great wave on the side nearest the moon, because they are pulled more strongly towards the moon than the solid globe is. Those on the opposite side get heaped up likewise, because the solid globe is, as it were, pulled away from them. Two great waves are thus caused simultaneously by the action of the moon, and the course of the tides (the period and height of their rise and fall) depends chiefly on the phases of the moon. The influence of the sun is principally manifested in increasing the height of the tidal waves at new moon (when the sun and moon are on the same side of the earth and reinforce each other by pulling in the same direction), and at full moon (when they are on opposite sides and reinforce each other in another way, the sun's near wave being increased by the moon's distant one, the sun's distant wave by the near wave of the moon). The high tides occurring at these times are known as **Spring Tides**, which therefore occur at intervals of a fortnight, and the very low tides which occur at half moon (also accordingly at intervals of a fortnight) are called **Neap Tides**.

In mid-ocean the height of the great tidal wave is much less than on the coast, and especially where the sea becomes gradually shallower as the coast is approached. In mid-Pacific it is only about three feet, in mid-Atlantic about twelve feet. The effect of a shallowing coast is

[1] The term *estuary* from Lat. *aestus*, the tide, is properly applied to the wide mouths of rivers exposed to tidal action.

to retard the progress of the wave, so that the advancing waters overtake those in front and cause them to be heaped up. The shallow bank on which the British Isles lie[1] thus serves to increase the height of the Atlantic wave, and this effect is enhanced in certain funnel-shaped estuaries or gulfs, where the wave is more and more retarded as it advances.[2] In the Bristol Channel, which has the highest tides in the British Isles, or indeed in Europe, there is sometimes a difference of more than forty feet between high and low water at spring tides; in Cumberland Basin, at the head of Fundy Bay, between New Brunswick and Nova Scotia (where are the highest tides in the world), the extreme difference is as much as seventy feet. In the case of the Bristol Channel the effect is partly due to the fact that two tidal waves unite to advance up the Channel at once. The wave from the Atlantic breaks into branches on the south coast of the British Isles. One branch passes round the North of Ireland, and at the mouth of the Bristol Channel meets and combines with a second branch belonging to the next tidal wave, about twelve and a half hours later.

Inland seas like the Mediterranean or the Baltic have scarcely any tide. Their narrow mouths prevent them from sharing in the tides of the ocean, and the volume of water in them is too small for them to have considerable tides of their own. There are few points in the Mediterranean where the tides reach three feet in height, few in the Baltic with tides of even one foot. The smallest body of water in the world in which tides have been ascertained to exist is Lake Michigan, where the highest rise at Chicago even in spring tides is only about three inches.

Currents.—With reference to the habitability of the earth, by far the most important movements of the ocean are its currents, chiefly owing to their effect on climate. The currents principally concerned in these effects are surface currents; but a consideration of these requires us to pay attention to another great movement of the waters of the ocean. The movement referred to is the gradual in-creeping of a vast body of cold water from the polar regions towards the equator, a movement whose existence, long surmised on the ground of observations of deep-sea temperature, has been clearly proved by the numerous additional observations that have been taken in recent years. These observa-

[1] See p. 189.

[2] It must be carefully noted that the advance of the tidal wave is different from the upward flow in a tidal river. The advance of the wave is indicated by the period of high water—that is, the time at which the crest of the tidal wave reaches a particular place; but the river continues to flow upwards for a considerable time after high water, as it continues to flow downwards for some time after low water.

tions have shown (1) that all the deeper parts of the ocean in free communication with the surrounding waters (from about 1,600 fathoms downwards) are occupied by a layer of ice-cold or nearly ice-cold water (31½°–35° Fahr.); (2) that inland seas (like the Mediterranean) and isolated depression basins cut off from the surrounding waters by a submarine ridge have bottom temperatures either corresponding to the mean winter surface temperature of the place, or the same temperature as that of the water at the level of the ridge; (3) that submarine banks or islands cause the cold waters to rise nearer the surface (they being, as it were, forced up by the obstruction); and (4) that the colder waters rise nearer the surface about the equator than they do even at a distance of from 30° to 35° on either side.

All these facts are explicable only on the supposition above stated, and we may hence assume that there is a slow but steady inflow of cold water from the polar regions to the neighbourhood of the equator, where the meeting streams rise towards the surface. The surface currents, on the other hand, mainly result in a transference of water from the equatorial regions towards the poles.

In the case of the chief surface currents there is little doubt that the prime movers are the winds; and hence in the domain of the most constant winds of the globe—the trade-winds—there are in both the great oceans two westerly [1] surface currents known as the **North and South Equatorial Currents**, in the Indian Ocean only the latter of the two. By means of these currents the waters are driven up against the eastern shores of the opposite continents or the islands lying off them, and are hence compelled to take another direction. Part of the water consequently returns eastwards, forming what is known as the Equatorial Counter-current, which in the two great oceans is between the north and south equatorial currents, in the Indian to the north of the only direct trade-wind current. Part of the water passes, however, obliquely to the north and south along the eastern shores of the continent. Now here we may note an important consequence of the disposition of land and water. In the Atlantic the eastern shoulder of South America lies to the south of the equator and under the influence of the south equatorial current, so that a considerable portion of its waters is deflected northwards along with other waters derived from the north current, and, owing to the contraction of the Atlantic towards the north, the benefit of this gain of warm water is confined within a limited area, within which it is all the more appreciable. The benefit, too, is almost confined to the eastern shores of the North Atlantic basin, which are consequently more favoured than any other part of the world in the same latitude.

[1] Currents are named (unlike winds) from the direction in which they flow.

To understand this, we must trace the subsequent course of these equatorial waters. A large body of these waters enters the Gulf of Mexico, and being there deflected to the north-east, mingled with other water, quits the gulf at the strait between Cuba and Florida as a swift,[1] narrow,[2] warm,[3] current of deep blue[4] water, called the **Gulf Stream**, which thence proceeds north-eastwards, shallowing, spreading out, and finally breaking up into branches (a marine delta) as it advances. As a distinct current it comes to an end between long. 30° and 40° W., but a great deal of its waters is swept north-eastwards to the shores of Europe and Iceland (**Gulf Stream Drift**) under the influence of the prevailing south-westerly winds; a portion, however, returning southwards along the coast of Portugal and North-West Africa.[5]

The south-west branch from the south equatorial current of the Atlantic is much feebler, and there are no currents elsewhere which have anything like the same effect as the Gulf Stream in high latitudes. In the Pacific the current which answers to the Gulf Stream, known by the Japanese name of **Kuro Siwo**, or Dark[6] Stream, is the most important, but is colder than the Gulf Stream. In this ocean also the configuration of the continent is favourable to the transference of a considerable body of warm water by drift currents to the north-east shores of the basin (north-west coast of America), but the benefit derived therefrom is less than on the corresponding shores of Europe for the reasons already indicated. Like the Gulf Stream, the Kuro Siwo gives off a return branch that proceeds southwards, this branch bringing relatively colder water which skirts the coasts of California.

Though the principal surface currents are equatorial in their origin, **cold surface currents** are by no means wanting, and, as regards the action of these also, the northern hemisphere is greatly favoured as compared with the southern through the disposition of land and water. The only important surface current from the Arctic seas proceeds from Davis Strait along the east coast of North America. It is known as the **Labrador current**, and advances southwards between the Gulf Stream and the coast of the United States, where it is known as the **Cold Wall**, on account of the sharp distinction in temperature between its bright green waters and the blue waters of the Gulf Stream. The

[1] About four miles an hour.

[2] About thirty miles wide.

[3] Above 80° Fahr.

[4] The depth of colour due to the high degree of saltness, and that again to the great amount of evaporation from the warm water.

[5] Within the area round which the currents belonging to this system flow lies what is known as the *Sargasso Sea*, where the surface of the ocean is thickly strewn with a floating seaweed.

[6] That is, *dark blue*. See Note 4.

shallow Behring's Strait does not admit any cold current to the Pacific Ocean; but, on the other hand, no less than three cold surface currents take their origin in the Sea of Okhotsk, in the north-east of Asia—one skirting the west coast of Kamtchatka and passing southwards by the Kurile Islands, and one on each side of the island of Sakhalin.

But in the more open seas of the south the cold currents are very important. Everywhere beyond 45° S. the waters of the Southern Ocean appear to be drifting north-eastwards, and on the western coast of all the great land-masses of the south (South America, Africa, Australia) this drift is continued in the form of a cold current proceeding northwards. The most important of these is the **Humboldt** or **Peruvian current**, which advances along the west coast of South America to 4° S. The presence of this cold water is now, however, ascribed by many to the rise of water from below to replace the surface water drifted westwards by the trade-winds.

Local currents are often produced at the mouths of inland seas from different causes. Through the excess of evaporation over rainfall and over the influx of rivers in the Mediterranean and the Red Sea, there are inflow currents at the Straits of Gibraltar and Bab-el-Mandeb to make good the loss of water which thus ensues; and for the opposite reason there are outflow currents at the mouth of the Baltic (Kattegat) and Black Sea (Bosporus). In each case, however, there is a deeper current in the opposite direction, no doubt due to the differences in saltness between the communicating seas. There are numerous other local currents which it is not always easy to explain, but which often have important effects through the sediment which they carry extending the coast-line seawards and silting up harbours.[1] Coasts directly exposed to currents carrying much sediment are generally flat and bordered by shallow seas, often lined with sand-dunes, and hence not easily accessible to shipping; while rocky coasts, on the other hand, are generally bordered by deep seas and have numerous creeks and natural havens.

Marine Life.—In the sea, as on land, the greatest variety of animal and vegetable life is found within the tropics, species becoming less numerous towards the poles. In the sea, animal life is everywhere much more abundant and varied than vegetable, and it extends to a much greater depth. Even the lower forms of Algæ (the group to which most sea-plants belong) do not extend below 250 fathoms, while animals have been dredged up even from a depth of 3,000 fathoms. Among the forms derived from these dark deeps a large number are phosphorescent—emit a light of their own. The effect of the uniform deep-sea temperatures on the life of the waters is worthy of note, inas-

[1] See pp. 178, 210, 211.

much as it enables some species of whales, for example, to live in all parts of the ocean.

The oceanic circulation is of importance to ocean life in several respects. In the first place it is chiefly by means of the vertical circulation—that is, the sinking of cold polar waters from the surface to the bottom (to rise again at the equator)—that oxygen, which is as necessary to life in the ocean as on the land, is carried down to great depths; and the comparative dearth of life in the Mediterranean, for instance, is explained as a consequence of the submarine ridge at its mouth shutting out the bottom waters of the Atlantic and so limiting the supply of oxygen. Secondly, almost all the fishes extensively used for food (cod, herring, &c.) inhabit cold water, and are brought in immense profusion by cold currents to lower latitudes than they would otherwise reach, as to the shores of Newfoundland in North America, Yezo and Korea in the east of Asia, Table Bay in the south-west of Africa.

Climate.

Under this head three subjects are considered: **temperature, rainfall, and salubrity.** On the distribution of **temperature and rainfall** over the surface of the earth much light is thrown by facts that have been mentioned already. Near the beginning of this Introduction it was explained why temperature is on the whole higher within the tropics than elsewhere. There also temperature is on the whole most equable throughout the year, because in that zone the variations in the height of the sun are less, especially in very low latitudes.[1]

The torrid zone is also on the whole the region of the greatest rainfall, which is a natural consequence of the nature and origin of rain. The source of rain is vapour or invisible moisture in the air, and the vapour is due to **evaporation**, or the conversion into an invisible form of water (snow or ice), a process always going on over the surface of the globe, and especially over the ocean. Though the process goes on even at freezing temperatures, evaporation is hastened by heat, and is always greatest where heat is greatest, and hence most rapid in tropical seas. To condense or render visible this vapour, cold is necessary; but even in the torrid zone that cold is found in the higher regions of the atmosphere, to which the moisture is drawn up by ascending currents of warm air. The vapour is first condensed into clouds, which consist of minute drops of water (hence elevated mists),

[1] Except on the borders of the torrid zone the sun is to be seen at midday sometimes to the north, sometimes to the south, of every place within that zone, and the variations in the height of the sun are consequently less than where for half the year its position at midday is always becoming further north, for the other half of the year further south, as it does everywhere outside of the torrid zone.

or, when very high, of particles of ice. The necessity for a certain amount of cold to produce condensation is an important fact to bear in mind in considering the distribution of rainfall. The greater the cold the less the amount of moisture that can remain as vapour in the atmosphere. Hence it is that all parts of the earth where the rainfall is very deficient are such as have, at least, very warm summers, for where the atmosphere is very cold even a small amount of moisture will be condensed. Hence, too, on the other hand, even in the torrid zone, the trade-wind region has very little rain, for, great as the evaporation is, the winds are always carrying the moisture onwards to latitudes where still more vapour can be retained without condensation. The belt of calms and variable winds between the trade-wind belts is that in which the most regular tropical rains occur. In it heavy rains take place daily, but, as generally happens in tropical climates, the rain falls in deluges[1] when it does fall, but not for long together.

Such are the most general facts regarding the distribution of rainfall and temperature over the globe; but the circumstances that modify that distribution are of even greater interest, if not of greater importance. And with regard to the modifying circumstances there is one general fact to be borne in mind, **that it is the winds which are the direct carriers both of temperature and moisture from one part of the earth to another.** The modifying circumstances accordingly are those which affect the amount of heat and moisture which the winds carry. Of these there are three of sufficient consequence to be taken into account even in the briefest outline of the present subject. These are (1) the general relations of sea and land; (2) ocean currents; and (3) superficial configuration.

(1) **Effects of the Relations of Sea and Land.**—(*a*) **As regards temperature,** the sea being more slowly heated and cooled than the land,[2] regions under the influence of sea breezes have a more equable temperature than those in the interior of continents removed from such influences. This is shown in the most instructive manner on charts indicating the average or mean temperature of different parts of the globe by means of **isothermal lines**—that is, lines connecting places having the same mean temperature for particular periods (as the whole year, the winter or summer months, the months of January and July &c.) A comparison of the isothermal lines for January and July in the north temperate zone is what brings the fact now dwelt on most prominently into view, showing at a glance that the former isothermals (those for the coldest month) rise, while those for the hottest month sink on both sides towards the sea. In other words, they show that when

[1] Mostly in the afternoon and evening, when the power of the sun has declined.

[2] See above, p. 43.

we proceed inland from either coast on the same parallel of latitude we come to places that have greater cold in the depth of winter, greater heat in the height of summer, than those from which we started.

(*b*) **As regards rainfall,** regions exposed to winds from relatively warm seas have abundant rain. Hence it is that, except where mountains intervene, all parts of the earth in which monsoon winds prevail have abundant rains during the summer of the respective regions (in opposite seasons accordingly in the northern and southern hemispheres), and that the rains are most plentiful where they come from tropical seas (India, Indo-China, Eastern Archipelago, north of Australia).

(2) **Effects of Marine Currents.**—These are most marked where the temperature of the current is considerably different from the average temperature of the latitude. Hence **the warm currents which have the most noteworthy effect in this respect are the Gulf Stream Drift and Kuro Siwo Drift,** and more especially the former. The effect of these currents is, on the one hand, to equalise the temperature of the west coasts of Europe and North America in a much more marked degree than is done by the mere proximity of the sea, and, on the other hand, to supply the same coasts with plenteous rains, which fall all the year round, but chiefly during the autumn and winter months. The equalising of the temperature is chiefly the result of the raising of the temperature of winter by the prevailing south-west winds, which have their temperature maintained by the warm currents over which they blow. But it must also be remembered that the summer is cooled not only in consequence of the sea being everywhere in that season colder than the land, but also through the prevalence of clouds which keep off the heat of the sun. The abundance of rain is due to the relatively great amount of evaporation over the warm seas, and its greater abundance in autumn and winter to the fact that there is then the greatest difference between the temperature of sea and land.

A moist, mild, and equable climate is thus the characteristic of the regions under the influence of the currents above named, and in the latitudes to which they belong the extremes of temperature increase and the rainfall on the whole diminishes as we go eastwards, until we approach the eastern shores, where again an equalising effect is observable to a comparatively slight extent. The easterly increase in the cold of winter is especially marked, and the part of the habitable land surface of the globe where the greatest cold is experienced lies near the north-east of the broader of the two great land masses of the northern hemisphere.

The cold current which has the most marked effect on climate is the Humboldt or Peruvian current, which advances so far within the tropic

of Capricorn on the west coast of South America.[1] Similar but less marked effects are noticed in the west of Africa and Australia, where corresponding currents are found.

(3) **The effect of superficial configuration on climate is shown in various ways.** (*a*) In the first place, mountains often act as barriers to winds, and cut off the regions behind them from the temperature and moisture which they carry.[2] In the case of rainfall the effect of a mountain barrier is even more marked than in the case of temperature, because mountains (or the edge of a plateau), in compelling rain-bearing winds which strike against them to ascend to higher and colder regions of the atmosphere, cause most of their moisture to be condensed on the side exposed to the wind. The highest rainfalls are, therefore, always met with in elevated regions, and mountains, even when far in the interior of a continent, often have their position pretty well determined on a rainfall map through the indication of a higher rainfall where they are situated. Especially is this the case when their general direction is at right angles to the prevailing rain-bearing winds.

(*b*) The effect of elevation in lowering temperature has already been alluded to incidentally more than once, and is a fact familiar to almost every one. The effect is due to several causes. (1) Air is heated with greater quickness in proportion to its density. The rarity of the air at great elevations is therefore unfavourable to its temperature. The effect of the sun's rays on the ground or any object on which they shine directly is not diminished by the elevation. At the height of 10,000 feet in the Himalayas, Hooker on one occasion observed the temperature to rise to 132° Fahr. when shaded snow close by was at a temperature of 22°. (2) Air at any elevation receives very little heat from the direct rays of the sun. Almost all its heat is derived from the ground, partly by direct contact, but mainly through the dark rays[3] which are reflected from the surface of the earth; and hence not only is the temperature greater or less in accordance with the elevation, but also in accordance with the nature of the ground (its power of absorbing or reflecting heat). For this reason, too, the decrease in temperature with elevation is the more rapid the more isolated a mountain is—most rapid of all in balloon ascents. (3) Air is more readily heated the greater the amount of vapour it contains, since vapour absorbs the heat of the dark rays to an enormously greater extent than dry air; and, as a rule, the lower the elevation the greater is the amount of vapour present. The presence of vapour is of special importance in preventing the loss of heat by night, and hence dry regions even on plains are subject to great extremes of

[1] See p. 48. [2] See pp. 184, 186, 254, 273 (*n.* 2), 289, 295, and comp. p. 72.
[3] That is, rays of heat unaccompanied by light.

temperature by night and day, which has this advantage, that during the cold nights the ground becomes so chilled that what moisture there is near the surface becomes deposited in the form of dew.

On account of the variations in the circumstances affecting the decrease of temperature with elevation, the rate of decrease varies so much that no general rule can be given with regard to it. On a very general average the rate of decrease is about 1° Fahr. for every 300 feet of ascent.

The Snow-line.—Whatever the rate of decrease may be, it is everywhere sufficiently rapid to allow of the existence in all latitudes of mountains which rise above a limit beyond which their sides are clothed winter and summer with snow—the limit shortly called the snow-line. Even in the torrid zone near the equator a mountain 16,000 feet in height rises beyond that limit. The elevation of this line does indeed depend largely on temperature, and more particularly on the temperature of the hottest months, but is not determined by that exclusively. The moisture of the climate has a marked effect upon it and where more snow falls in the course of the year on the sunny than on the shady slopes of a mountain range, the former side, which usually has the higher, may have the lower snow-line, as on the Himalayas.[1]

One advantage of this accumulation of snow on mountains consists in this, that it affords a partial protection of the valleys from floods; but this advantage is not the sole one. Below the snow-line the winter cloak of snow is necessary to preserve many of the so-called alpine plants from a greater cold, which would destroy them; and it need scarcely be added that it has a similar advantage in plains that have a regular winter garment of the same nature. It is in consequence of this protection that winter wheat can be grown in Canada and the Canadian North-West, while it cannot be grown in the south-east of Russia, where the dryness of the air, and the consequent scantiness of the snowfall, leaves the seed exposed to the rigours of the winter frosts.

Glaciers.—In the folds or high-lying valleys of snow-clad mountains the snow gradually sinks through the pressure from above, and, after passing through a stage[2] in which it is composed of large granules which are neither ice nor snow (due to melting by day and freezing by night), at last gets consolidated into a mass of ice, called a glacier. The behaviour of a glacier is highly remarkable. Solid as it is, and rigid and brittle as we know ice in small lumps to be, the glacier moves slowly downwards like a river. It moves, that is to say, quicker at the surface than at the bottom, quicker in the middle than at the sides, quicker towards the inside of concave bends in its course than towards the opposite side. The rate of motion, however, is so slow as to amount in the Alps to only a few inches per day. The mode of its motion is

[1] See p. 63, a. [2] In this stage known as *névé* (French), or *firn* (German).

difficult to explain, but it is known that even below the freezing-point ice can be melted by extreme pressure and that the water will at once freeze again when the pressure is removed; and it is also known that fragments of ice readily get re-frozen into a solid lump. Most probably, therefore, the motion which makes a glacier appear as if it were composed of a very thick or viscous fluid, is due to crushing or melting of the ice at different places, and to the melted parts freezing again, or the crushed parts becoming re-consolidated when they have escaped from the action of the crushing or melting force. The level to which a glacier may descend depends (like the snow-line) upon the tempera-

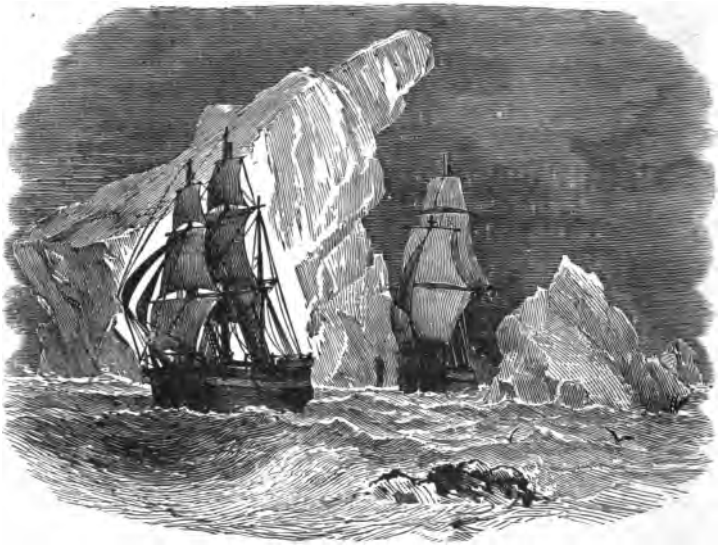


FIG. 12.—ARCTIC ICEBERGS.

ture and the amount of moisture by which it is fed, but it is usually thousands of feet below the limit of perpetual snow.

Slow as the motion of a glacier is, so great is their mass (hundreds and sometimes thousands of feet thick), that glaciers act even more powerfully than running water in wearing away the land. They round off the inequalities in the surface of their bed, scratch the rocks, and bruise the smaller fragments against one another, and press the soft materials of their bed into a tough clay. From an ice-cavern at their lower end almost invariably issues an ice-cold turbid stream (glacier milk), the solid matter in which is in part an evidence of the

grinding action of the glacier mass. Yet this solid matter is far from being wholly due to the grinding of the glacier on its bed. Much of it comes from above. By the process already explained frosts cause great quantities of matter to be poured down upon the surface of the glacier from the rocks which bound and surmount it, and the finer matter is washed down by the rains and melted ice, which chiefly feed the stream at the bottom, through the numerous fissures by which the glacier is traversed. The larger fragments remain at the sides of the glaciers, forming **moraines.**[1] Where two glaciers from two adjoining valleys unite, a **middle moraine** is formed by the union, and in the end many of these fragments are strewn at the foot of the glacier, where they form an **end moraine.** From the existence of such deposits at levels far below their present ones (as well as from other signs), it is known that at some remote period (yet geologically a recent one) glaciers in many parts of the world covered an enormously greater extent than they do now.[2]

Icebergs and Ocean Ice.—Where (in high latitudes) glaciers descend below the water's edge in sufficiently deep water, their ends get broken off, and float away as icebergs, which also have in certain parts of the world an important effect on climate. From the mode of their origin it will be observed that they are composed of fresh-water ice, and in computing their true size the relative weight of fresh-water ice and sea-water must be taken into account. The difference in weight between these two substances is such that only from one-tenth to one-ninth of the whole mass of an iceberg rises above the surface. The actual depth below the surface depends largely on the form of the iceberg, but has been found in certain cases by actual observation to be more than eight-ninths of the total height. In the case of regular flat-topped icebergs (such as are very common in the Southern Seas), it may be always assumed that that proportion of the total height is beneath the surface; and accordingly a single iceberg of such a size as has been observed on more than one occasion may contain as much as a cubic mile of ice. One of three miles in length, and about 200 feet high, which was seen during the *Challenger* expedition, would have that bulk even if its width was only one-third of its length.

From the high latitudes where they take their birth, icebergs are drifted into lower latitudes by the cold currents which issue from Arctic and Antarctic Seas, and hence the set of these currents has an important effect on their distribution. Owing to the general north-easterly drift of the waters of the Southern Seas, icebergs may be

[1] See cut, p. 232.

[2] At this period, known as the *Ice Age*, a large part of North America appears to have been covered with ice, in some places thousands of feet thick.

encountered in comparatively low latitudes at many places in the south, but in the north they are confined to the western parts of the Atlantic and Pacific Oceans. It is only in these parts that they

FIG. 13.—SCENE IN A TROPICAL FOREST (BRAZIL).

descend below 40° N., whereas they may be fallen in with at 40° S., or even lower, everywhere in the South Atlantic Ocean.

The freezing of salt water takes place at a lower temperature than that of fresh—about 29° Fahr., instead of 32°—and the ice when formed is different in composition from the water of the ocean, which in freezing manages to get rid of a good deal of its salt. It is met with in various forms. When covering wide surfaces it is called **field-ice**; a large floating mass is called a **floe**; pieces of broken ice closely crowded together constitute **pack-ice**; and when floating about more freely in the direction in which they are carried by currents, they are known as **drift-ice**. The greater cold of the eastern shores of the Old World, as compared with those of the New, allows of the freezing of the China Sea below latitude 40°, while in North America the most southerly sea that freezes is the Gulf of St. Lawrence, about eight or ten degrees farther north. In both of these cases, however, the freezing is promoted by the exceptional freshness of the waters.

Salubrity.—The healthiness of a climate depends on such a variety of circumstances that little of a general nature can be said on this subject. A healthy climate for the natives of the region is often unhealthy for the natives of other regions. All low-lying tropical lands are more or less unhealthy for Europeans, and in warm countries generally, whether tropical or outside of the tropics, stagnant water is peculiarly unhealthy, producing malaria, and rendering the inhabitants liable to fever and ague.

Vegetation and Animal Life.

The vegetation of the land surface of the earth often has a distinct stamp in accordance with the physical features, and the nature of the animal life is greatly affected by the vegetation. Heat and moisture are the conditions most favourable to vegetable life; **the most luxuriant vegetation, therefore, is to be found in the moister parts of the torrid zone** (the valley of the Amazon and the islands of the Eastern Archipelago), **and the moister and warmer parts of the monsoon area.** Dense forests, composed of an almost endless variety of trees and filled with an even greater variety of vegetable life of other kinds, are characteristic in all these regions, except where there are thickly inhabited plains. Trees even advance into the ocean, forests of **mangroves** lining coasts within and near the tropics for hundreds of miles together, especially about the mouths of rivers. **Palms** are also highly characteristic, about a thousand different kinds being found within the tropics, and none far beyond their limits. Almost equally characteristic among animals are **monkeys, parrots, and termites or white ants, the last of which are**

terrible devastators, and in some places, from the ravages which they commit among woodwork, compel the inhabitants to build houses of such light structure that they can easily be restored when their timbers have been hollowed out by these insects.

In the temperate zones the variety of vegetation diminishes, and in the cultivated parts of those regions the forests are for the most part confined to the mountains. There they are of use, like snow, in arresting the moisture and thus helping to protect the river valleys from inundation, as well as to prevent mountain pastures from being washed away by the violence of the rains. Still further north, forests, less varied still in their character, being now chiefly composed of pines

FIG. 14.—A MANGROVE SWAMP.

and firs, again cover the plains, and are haunted by fur-bearing animals. Trees, shrubs, and herbs all in turn disappear, until at last on the borders of the Arctic seas the only vegetation consists of mosses and lichens, uniform in their character, but often rich, splendid, and highly varied in colouring.

Characteristic changes are likewise observed if we pass to warm but arid regions. In steppes, grasses and lily-like plants, which by means of their thick matted roots and their large underground bulbs are enabled to withstand long periods of drought, are the prevailing vegetation; and hence burrowing animals which feed on these roots and bulbs are among the characteristic fauna (the bobak in South Russia, the prairie-dog in North America, the vizcacha in South America). Above ground, fleet-footed antelopes, horses, oxen, &c., graze the herbage, and these are

followed by the carnivorous animals which make them their prey. In the vegetation of dry regions, trees and bushes with thick leathery leaves, with fleshy stems and prickles, like the cactuses of the interior of America and the euphorbias of Africa, are also characteristic. In deserts where there is any vegetation at all it is mostly composed of prickly plants (on which only the camel can feed); and in salt steppes the chief covering of the ground consists of pale green herbs (salt-bush, &c.), which sometimes afford good fodder for sheep and cattle.

The increase in cold with elevation causes similar changes in vegetation to be observed in ascending a mountain to those which are seen in going from lower to higher latitudes. A snow-clad tropical mountain exhibits all the varieties of vegetable life met with between the equator and the Arctic Regions.

Man.

The vigorous vegetation of the moister parts of the torrid zone is in itself unfavourable to the development of man, leaving little room for human habitations; while the enervating effect of the heat and the ease with which food can be obtained from the vegetable kingdom, cause him to be little disposed to contend with nature so as to keep down the aggressive plant life. Hence the island of Java and some parts of southern India are the only regions of the torrid zone in which the density of the population approaches that of the more populous districts of Europe. Both of these countries, it should be observed, are now under European control. In Java the present density of population is a direct consequence of European (Dutch) management; and though southern India may have had a tolerably dense population before it came under British influence, it must be noted that the greater part of that region suffers rather from a deficiency than from an excess of moisture. The oldest civilisations of which we have any record arose in the warmer parts of the temperate zone, and were in some cases (Assyria, Babylon, Egypt) assisted in their growth by regular inundations, which fertilised the ground and facilitated irrigation. The colder parts of the temperate zone, where the most advanced civilisations are now found, had to a large extent to be made fit for human habitation by the clearing of forests and the draining of marshes,[1] and the seeds of civilisation were planted there by people who had become powerful in warmer and drier regions. Rome laid the foundation of the higher forms of civilisation throughout a great part of Europe, both in the warmer and the cooler and moister regions; and even where it did not do so directly its example was, no doubt, directly or indirectly, of great importance in promoting that development elsewhere.

In particular, it is to Rome that southern and western Europe owed

[1] See p. 223 (under Forests).

the first construction of many of their chief roads, for road-making was one of the principal means adopted by that power for the spread of her own civilisation. Roads, indeed, are an essential condition of the maintenance of a dense population wherever there is not an exceptional abundance of waterways.

The ease with which a country can be supplied with roads is accordingly a circumstance of great importance with reference to the growth of its population, and this does not depend solely on the superficial configuration. Mountainous countries present one obstacle to road-making too obvious to need pointing out; but vast level plains may present obstacles of another kind, as in the plains of Hungary, where there is an entire absence of road-making material, and in those of Russia and Siberia, where, in addition to that deficiency, extensive marshes or soft ground offer further difficulties. Hence in such countries the construction of railways in quite modern times is a fact of peculiar importance. The railways (as well as the roads) of mountainous countries show the importance of superficial configuration by the way in which their course marks out the lowest levels and the easiest slopes. And here we may note that the importance of rivers with regard to communication does not lie solely in their navigability, but largely arises from this: that the valleys which they, with the help of rain and other denuding agents, have made for themselves often contain the routes along which roads and railways are most easily carried.

The Growth and Position of Towns.—Where a dense population exists, it is in some places pretty equally distributed over the surface, in others congregated to a great extent in large towns. Each town has its own history, and though the growth of all towns must depend more or less on physical features, the conditions that favour their growth are so varied that it is impossible to say why certain towns should be in certain places without taking that history into account.[1] Nevertheless there are one or two general facts of interest which it is well to bear in mind regarding the growth and position of towns.

Most towns, whatever their subsequent history may be, are originally centres of trade. They arise in places where it is most convenient for the products of a district to be collected in order to be sent out again in other directions to the places where they are required. Hence it is that in new countries or regions with a one-sided industry, like the British colonies of America and Australia, and parts of the United States, which are chiefly engaged in the production of food and raw

[1] The modifications which man himself makes in the physical features of the globe have in many cases an important influence on the position of towns. It is for this reason, among others, that many of the chief towns of Roman Britain no longer have the importance which they once had.

materials, large quantities of which must be sent to distant parts in exchange for manufactured articles, large towns have grown up with extraordinary rapidity (Chicago, St. Louis, San Francisco, Melbourne, Sydney).

When the positions most generally occupied by towns are considered, the influence of trade in promoting their growth may be observed under most of the heads under which these positions may be classified.

(1) Out of 233 towns which, according to the most recent returns or estimates, had at least 100,000 inhabitants, 102 are seaports—either situated on the sea-coast or near the mouths of rivers where they are navigable for sea-going vessels. In the case of river seaports, the situation is sometimes (*a*) at the highest point to which the tide rises (Glasgow), (*b*) at the head of navigation for large vessels (Brisbane), (*c*) at the head of navigation for smaller sea-going vessels. The increase in the size of sea-going vessels in modern times has in several cases led to old seaports being wholly or partly superseded by newer ones nearer the mouth of the same river or its estuary, as Bordeaux by Pauillac, Nantes by St. Nazaire, Rouen by Havre, Bremen by Bremerhaven; in other cases it has led to the artificial deepening of the old port and its approaches (Glasgow, Seville).

(2) Of towns which are not seaports, a large number are on navigable rivers, and among these (*a*) many lie at or near the confluence of two rivers (Wentworth, St. Louis); (*b*) many at river bends, where merchandise has to be landed in consequence of the change of direction in the stream (Echuca, Cincinnati, Galatz, Kazan); (*c*) many at the lowest point at which a river can be bridged (Buda-Pest, St. Louis), or at some point where the nature of the banks makes the bridging of the river exceptionally easy (Magdeburg); (*d*) many at the head of navigation (Albury, Rockhampton, Ipswich, Ulm, St. Paul).

(3) Many towns (whether situated on navigable rivers or not) owe their importance to their situation at the meeting-place of trade routes. In this case they may occupy either (*a*) a central position in plains, such a position being the natural crossing-place of roads from all quarters (Moscow, Bukarest); (*b*) a site in a fertile valley at the foot of a mountain pass (Tiflis), or the point of convergence of several passes (Milan); or (*c*) a position on the edge of a desert across which caravans carry the merchandise collected from other quarters by roads or rivers (Damascus, Timbuktu, Harrar, Lahore, Delhi).

(4) In many cases facilities for defence first led to the rise of towns, but their subsequent growth is greatly affected by their possession of advantages for trade such as have been pointed out.

(5) In modern times districts rich in coal and iron have become the seats of numerous large towns engaged in large manufacturing

industries (round Manchester, Leeds, and Birmingham in England ; in Belgium ; in the Prussian province of Westphalia, &c.), and some towns so situated are remarkable for their rapid growth (Birmingham, Ala.).

Towns once in existence (whether they owed their origin to advantages for trade or not) tend to grow in size for various reasons, and the causes of growth are generally most numerous in capitals, which accordingly are often very populous even where the physical features are not specially favourable to their development.

In the diagram on p. 68 A and B represent a section across Central Europe about the meridian of 8° E.: A, vertical 6 times the horizontal scale; B, vertical 15 times the horizontal scale. *a*, Col di Tenda; *b*, Turin; *c*, Monte Rosa; *d*, Mischabelhorn; *e*, Rhone valley (Brieg); *f*, Jungfrau; *g*, Aar; *h*, Rhine; *i*, Feldberg (Black Forest); *j*, Middle Rhine valley; *k*, Hardt; *l*, Westerwald; *m*, North German plain.

C. Section across Asia about the meridian of 87° E., from the valley of the Ganges to the delta of the Yenisei. *a*, Mt. Everest; *b*, Tibetan plateau; *c*, Kuen-lun; *d*, Altyn-tagh; *e*, Tarim basin; *f*, Tian-Shan; *g*, Byelukha (Altai); *h*, Siberian plains.

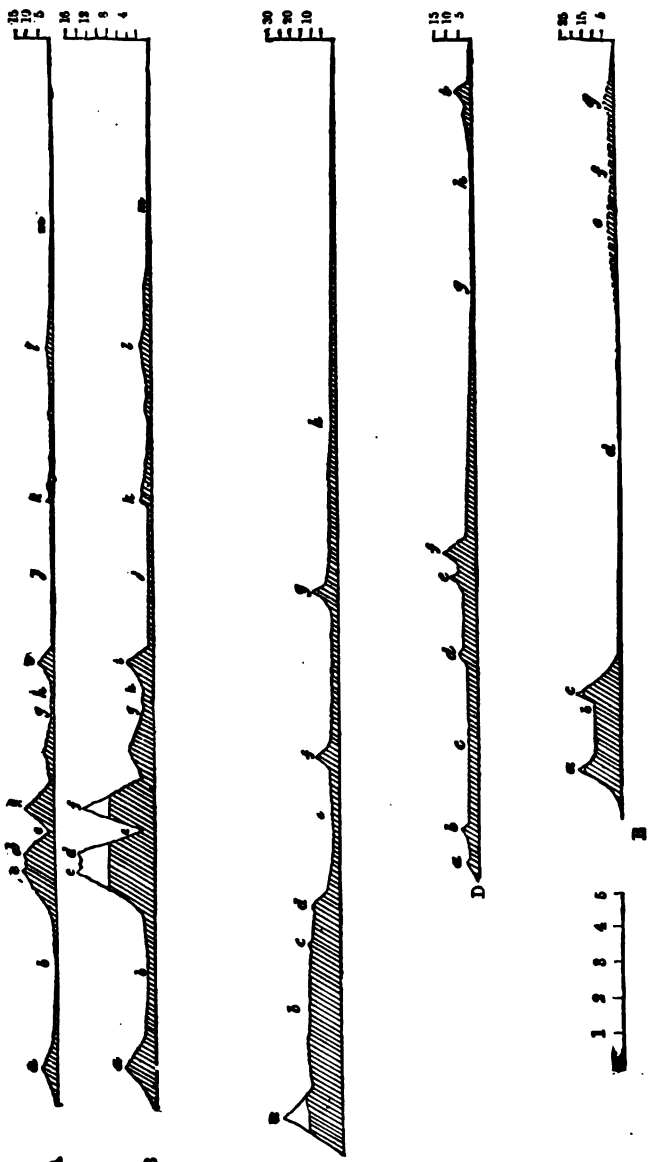
D. Section across North America about the parallel of 40° N., from the west coast to the Mississippi valley and thence south-eastwards to the Atlantic. *a*, Coast Range; *b*, Pilot's Peak (Sierra Nevada); *c*, The Great Basin; *d*, Wahsatch Mts.; *e*, Dome Peak; *f*, Long's Peak; *g*, Mississippi; *h*, Ohio River; *i*, Black Dome (Appalachian Mts.)

E. Section across South America about the parallel of 16° S. *a*, Misti; *b*, Lake Titicaca; *c*, Sorata; *d*, Amazon Basin; *e*, *g*, Brazilian mountains (elevations uncertain); *f*, San Francisco River.

The horizontal scale represents hundreds of miles for C, D, and E, intervals of 20 miles for A and B. In C, D, and E, the vertical is 30 times the horizontal scale. In B, C, and E, the untinted portion shows the height above the snow-line. The figures on the vertical scales indicate thousands of feet.

COMPARATIVE TABLE OF THE GREAT LAND MASSES OF THE GLOBE.

	Area in millions of square miles	Percentage of the total land surface	Ratio to Europe	Population in millions	Density of population
Asia	17·3	32·8	4·7	825	49
America	14·8	28·2	4·0	121	8
Africa	11·5	22·0	3 1	163	13
Europe	3·7	7·1	1	357	96
Australia and Oceania	3·5	6·6	0·9	10	2.8
Arctic and Antarctic Regions	1·7	3·3	0·5	—	—


A
B
C
D
E
1 2 3 4 5 6

AMERICA.

The Name.—The two continents, or the double continent, of North America and South America are known also by the one name America. The name Central America[1] is applied to that portion of America between Mexico and Colombia. Although called by Europeans the New World,[2] in contrast to the more familiar East, America is geologically old, since a very large area consists of the oldest known rocks, the Archæan. The oldest evidences of man's existence upon earth have also been found in its strata.

Structure.—**In the general arrangement of its land mass** the Western Hemisphere as a whole corresponds to the Eastern in various features. Thus the greatest length of the one is about the same as that of the other, a line drawn from Cape Horn through the two Americas to Bering Strait being nearly equal to a line from Bering Strait through Asia and Africa to the Cape of Good Hope. Along these lines are the most extensive systems of mountains and plateaus in each hemisphere. These great elevations, or the main axes of the continents, extend almost continuously from the southern point of the New World around and near the Pacific and Indian Oceans to the southern point of the Old. The long slope of the land in the Western Hemisphere, upon which its largest river-basins lie, descends to the Atlantic and Arctic Oceans, as does also the long slope of the Eastern Hemisphere. These two slopes are thus inclined towards each other with the narrower oceans between. The short slopes are separated by the broad expanse of the Pacific and Indian Oceans.

On each side of the Atlantic a great inland sea reaches far into the land, the Mexican Gulf westward and the Mediterranean eastward, and these divide the long slopes into northern and southern areas, which also resemble each other in general outline, hemisphere for hemisphere. America is thus a counterpart of the Old World in forming a symmetric whole.

[1] The term Central America is applied by some geographers to the land from the Isthmus of Tehuantepec to the Isthmus of Panama. The term Middle America is used as including Central America, Mexico, and West Indies.

[2] Australia, likewise a late discovery, is sometimes mentioned as a part of the New World.

Size and Position.—On account of its narrower form, however, it is not so large as the three eastern continents, whose combined area is double that of America, including the Arctic Archipelago and Greenland.[1] Both masses of land are crossed by the equator and have their largest portions north of it, America extending 72° towards the North Pole, and Asia 78°; but the northern area of the Old World is three times as large as that of America. The American mainland south of the equator is considerably larger than the African, being broader and reaching to 54° south latitude, while Africa extends southward only to latitude 35°.

The fact that South America is so situated that its greatest eastern angle divides the south equatorial current and turns part of it northward to be added to the Gulf Stream, is very important. Were Cape St. Roque 10° farther north, the climate of northern Europe would be much colder than it now is.[2]

Early History.—Discovered by Norsemen 500 years before Columbus's[3] first voyage, America was for a time occupied by them along the north-east coast;[4] but the settlers were soon driven out by the Skrölinger,[5] and the knowledge gained became merely a Norse tradition.

The **natives** inhabiting America did not develop a civilisation that led them to go out from the continent, and so to come into contact with either Europeans or Asiatics. No outward migration has ever occurred; but, on the contrary, America has ever been a receiver of peoples from other continents. Some of the first-comers are believed to have entered the continent *viâ* Bering Strait from northern Asia: others may have crossed the Pacific from south-eastern Asia or the neighboring islands. The highest civilisation that was developed was on the two table-lands of **Peru** and **Mexico**—in each at about the same distance from the equator,[6] and to about the same extent. Neither people had tamed animals for work or food; navigable rivers did not afford means of intercourse, and they both lived essentially an inland, isolated life. Yet they mined and used much gold and silver, and pro-

[1] Asia, Africa, and Europe, 32½ million square miles; North and South America, 16¼ million square miles.

[2] See pp. 46, 47.

[3] For mention of many other pre-Columbian discoveries of America, see Tillinghast's Ploetz, p. 280.

[4] Helluland, which means Stone-land; Markland, or Wood-land; Vinland, or Vine-land; Hvitramannaland, or White men's land, were names of various parts of the coast.

[5] Eskimo.

[6] See p. 23.

bably iron, carried on agriculture, and were skilled artisans. The **Aztecs**, who occupied the Mexican plateau, had a more accurate calendar than the Egyptians or Romans, and in picture-writing and hieroglyphics kept voluminous records of their history.

Two thousand bales of leaf paper was the yearly tribute of several cities to Montezuma II., their last king.

Roads of matched stone and aqueducts[1] still in use, ruins of beautiful palaces and temples built upon pyramids of which some exceed those of Egypt in size,[2] and fortifications[3] embodying principles not known to Old World engineers until the fifteenth century, are some of the products of the civilisation that was indigenous to America. The government in each land was firm and able, though despotic.

In other parts of North America[4] there are evidences in mounds, dwellings, and mines of the previous wide distribution of

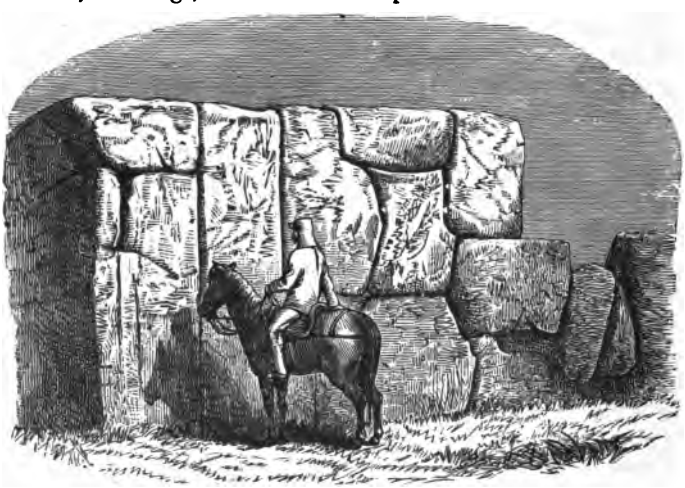


FIG. 15.—FRAGMENT OF AN OLD PERUVIAN WALL, CUZCO.
(By the kind permission of Messrs. Hachette.)

the northern race; but on the discovery and exploration of the continent by Europeans, the natives there and on the lowlands of

[1] In Peru. [2] In Mexico. [3] In Peru.
[4] Arizona, New Mexico, Mississippi valley, Ohio valley, and near Lake Superior.

South America were found to be mostly savages, living by hunting, trapping, and fishing. Grazing was not practised. Probably by reason of the abundance of game, the domestication of the various wool-bearing and milk-giving animals had not become a necessity to the hunting tribes, while the easily cultivated maize, potatoes, plantains, and cacao furnished food to those that carried on agriculture.

The discovery of America in 1492 was an outcome of the commercial spirit then especially active in western Europe. It happened also at a time when the religious feeling was exceedingly bigoted and zealous. The effect was disastrous in the extreme to the civilisation already attained, and to the prospects for advancement of the lower tribes. In their hunt for wealth, Cortez and his followers plundered and destroyed the kingdom of the Aztecs, and in religious zeal burned the written records of their past, that the people might forget their idolatry. A like fate befell the Incas when Pizarro's army overran the Peruvian upland. The West Indies were nearly depopulated by the severities of slavery, and the condition of the Indians in general has almost invariably been made worse by contact with Europeans.

Before the voyages of Columbus, European geographers had supposed the Atlantic Ocean to extend uninterruptedly to the east coast of Asia, and that distance they much underrated.

In 1492 Japan was drawn on the globe in the latitude and longitude of Mexico; the islands north of Japan corresponded in position to the Rocky Mountains, while Siberia came so far east as to take most of the space now occupied by Alaska. A globe made about twenty-five years later shows a group of islands between Japan and Spain, the result of Columbus's voyages. To the south lies "Brasilia or the Land of Parrots," a large island, while to the north-east of "Terra de Cuba," Cabot's discoveries along the eastern coast (1497–99) appear as another group of islands. It was not known that a new continent had been found.

The first knowledge of the western coast was got through the discovery of the Pacific by Balboa in 1513. This was supplemented by the explorations of Cortez and of Pizarro and by later voyages, that of Drake (in 1577) having extended to Oregon, and Cook's (in 1776–80) to Cape Prince of Wales, which he named. Magellan found the southern limit when, on the first voyage by which the earth was circumnavigated (1519–22), he passed through the strait that bears his name. The North-West Passage was sought by Frobisher (1577), Davis, Hudson, Baffin (1616), and others, with such results as are recorded by their names upon the map.

By right of discovery and conquest the Portuguese possessed

Brazil; the Spanish, the rest of South America, the West Indies, Florida, Central America, Mexico, and a large area north of Mexico; the English held the Atlantic coast from Florida to the French possessions,[1] which last included the St. Lawrence basin and nearly the whole of the Mississippi Valley.

Of all these possessions, only Cuba and Porto Rico, with a few other islands, are now in the hands of their first European owners; but although ownership has disappeared, yet names, customs, languages, and religions still remain in many places, suggestive of history, and showing much of the character of the men by whom they were established.

NORTH AMERICA.

Approximate latitudes: Cape Barrow (north of Norway), 71° N.; Cape Farewell (St. Petersburg), 60° N.; Cape Sable, Florida, 25° N.; Isthmus of Panama, 9° N.

Approximate longitudes: East coast of Greenland, 20° W.; Cape Charles, 55° W.; James Bay, east coast of Florida, Gulf of Panama, 80° W.; Cape Mendocino, 124° W.; Cape Prince of Wales, 169° W.; Attu Island (Aleutian Isles), 172° E.

Area.—The area to be given for North America depends upon whether the Arctic Archipelago and Greenland are to be included or not. With these it amounts to nearly nine and a half million square miles; without them, to nearly eight millions. In either case the continent stands third in order of size, Asia and Africa being larger.

Form.—In its general outline North America is similar to South America, both being **triangular**. In each the western side is the longest, and the least indented. The northern coast of each extends through 18° of latitude (Cape Barrow, 71° N., Cape Charles, 53° N.; Cape Gallinas, 13° N., Cape St. Roque, 5° S.), and is bordered by an archipelago. On the south both become extremely narrow, and in a previous geologic age North America also ended in a peninsula. A later rising[2] of the crust of the earth created the mountainous Isthmus of Panama.

Were a sinking of 300 feet to take place at Panama, and one of a little more than half that amount at the Nicaragua depression, the land

[1] A break in the continuity of the English area was caused by the settlements of the Dutch and Swedes.

[2] See p. 34.

between would become an island, and North America, like Europe and Asia, the two other northern continents, would have three southern peninsulas,[1] the middle one with an island at its extremity, and the eastern one with an archipelago.

Along its eastern side the true limit of the continent is not at the present coast-line, but some miles beyond. An elevation of but 600 feet[2] would double the areas of Yucatan and Florida, and add a strip at places 200 miles wide from St. Augustine to the St. Lawrence. Cape Cod and Nova Scotia would nearly meet, and Newfoundland be doubled in size by the addition of the Banks. A peculiar feature of the eastern coast both of North and South America is the possession at places of a double coast-line. This consists of a series of natural levees, constructed of alluvial sand, by the mutual action of the river currents and the sea-waves. In front is the ocean or gulf; behind, quiet lagoons and sounds.[3] Two thousand five hundred miles of such coast afford many protected stretches where traffic with small vessels is greatly aided.

The western coast, on the contrary, is usually steep, and in middle latitudes broken only here and there by rocky bays and gulfs;[4] but from Vancouver Island northward and from Chiloe Island southward it is a fiord coast like that of Norway, western Greenland, or south-western New Zealand.

In the **extent of coast-line** relative to area North America is second only to Europe. Of its indentations the most important is the **Gulf of Mexico**, because of its influence on the climate.

From this great expanse of warm water comes much of the rain that falls in Mexico, and also a large part of the rainfall of the well-watered eastern half of the United States.

To the south-east of the Gulf is the great border sea, the **Caribbean**, enclosed by the coasts of South and Central America, and the Greater and Lesser **Antilles**. **Cuba** divides the entrance to the Gulf of Mexico into two channels, the **Yucatan Channel**, between Cuba and the peninsula of Yucatan, and the **Florida Strait**, east of which lie the **Bahama Islands**.

Through the Yucatan Channel the warm waters of the equatorial current pour into the Gulf, to issue later from the Florida Strait in the Gulf Stream.[5]

On account of its inland situation, great size, and high temperature, the Gulf of Mexico is often styled the Mediterranean of the Western World.

[1] See p. 286.

[2] See p. 25.

[3] Such as Albemarle Sound, Pamlico Sound, Mississippi Sound, Matagorda Bay, Laguna de la Madre, Lagoa dos Patos.

[4] Valparaiso Harbor, Gulf of Guayaquil, Acapulco Harbor, Gulf of California, San Diego Bay, San Francisco Bay, Puget Sound, Gulf of Georgia.

[5] Six months are required for the passage of the current through the Caribbean Sea and the Gulf.

In sharp contrast to the warm gulf of the south is **Hudson Bay**, the third largest inland sea of the world.

It is covered with ice many months in the year, while **Hudson Strait**, which extends from it 500 miles to the Atlantic, is liable even in summer to be filled with floating ice, which warmer weather sets free from the channels and bays of the Arctic Archipelago and the fiords of Greenland.[1]

This northern bay is situated in what is geologically the oldest part of the continent, the Archæan gneiss. The southern gulf, on the contrary, is bordered by the newest alluvial formations.[2]

Surface.—The **surface outlines** of North America and those of South America correspond so closely in their general plan, that both are better studied in a comparison. The one determining feature in each, in reference to which all other features are dependent or subordinate, is the **great highland area of the west**, called the **Cordilleras**, which in South America may be characterised as a system of lofty mountains enclosing high and narrow plateaus, while in North America it is a broad elevated plateau, carrying numerous ranges of mountains, which divide and subdivide its surface.

From the north of Alaska southward there is a gradual increase in the height and width of the North American table-land. It is widest in the United States, where the area above 2000 feet in height occupies about one-half their whole extent;[3] while beyond the Tropic of Cancer in Mexico it reaches a height of over 7000 feet, with peaks upon it 10,000 feet higher (Popocatepetl, Orizaba).

The chief ranges on the plateau are the **Cascade**, the **Sierra Nevada**, the **Wasatch**, the **Rocky**, and the **Sierra Madre**. The name Rocky Mountains is given in general to the series of ranges that form the crest of the plateau from Alaska to Mexico.

The **long slope** of each of these highland areas descends gradually towards the east, becoming finally **low plains** of great extent and uniformity. These plains are subdivided by **secondary elevations** into broad basins, and in these flow the magnificent streams which have given to America the name of the Land of Rivers.

In the north-east of North America is the rocky plateau of **Labrador**, the south-westerly extension of which, known as the **Height of Land**, determines the northerly flow of the rivers of the **Hudson Bay system**.

Similarly, the **Plateau of Guiana** marks off the basin of the **Orinoco**. The **St. Lawrence** system with the Great Lakes corresponds in position and importance to the **Amazon**, and has its basin bounded on the south

See p. 55. [2] See p. 33. [3] See p. 97.

by the northern slope of the **Appalachian Mountains**, whose corresponding feature in South America is the **Mountain land of Brazil**.

The **Mississippi** and **La Plata** systems are closely parallel in the structure of their basins, direction of flow, and arrangement of tributaries. Besides these similarities, however, there are several streams in North America to which South America has no parallels. The **Mackenzie**, carrying to the Arctic the waters from the great lakes of the Canadian plain, and the **Yukon**, which descends the gentle northern slope of the great plateau and turns westward towards the Pacific, are in position and size like the streams of Siberia.

The **Fraser** and the **Columbia** are plateau rivers, and, like the Congo,[1] descend in tumultuous cascades to the lower coast-land. The **Colorado** of the south-west, from its source in the Wind River Mountains to the Californian Gulf, passes through a wonderland of nature without a parallel in any other region of the globe. Nearly all the rivers are navigable, and the numerous large fresh-water lakes, of which North America has a greater area than any other continent, furnish also many thousand miles of navigable waters to inland commerce.

Climate.—1. Temperature.—In the **climate** of North America it is first to be noticed that the extent of the continent from north to south is so great that it has within its limits every grade of temperature, from **polar cold** to **tropical heat**.

The place of greatest cold is in the peninsula of **Boothia Felix**, which has an average winter temperature of 31° below zero. Greater cold has been known here and at other places, but for only short periods, as at Pembina in North Dakota, 58° below zero, and 40° below zero at many localities in the northern states and in Canada. The greatest summer heat is found in the south-western part of the plateau region, along the lower Colorado, where July averages over 95°, making this one of the hottest parts of the earth, and in the **Mohave Desert** a temperature of 127° has been recorded. The greatest average heat for the whole year is in Central America. Here, during the winter months, 68° is the mean temperature, as also in southern Mexico, while in summer it is 77°.

The western half of the continent has for the year a higher temperature than the eastern, since it receives warm winds from the Pacific; while in the east the cold ice-bearing currents of the Atlantic flow along the coast, reducing the summer warmth,[2] and northern winds increase the winter's severity.

In this difference of temperature between east and west, North America corresponds to the Old World, whose western or European coast is, at the same latitude, much warmer than its Asiatic east coast.[3]

[1] See pp. 340, 341. [2] See p. 47.

[3] A glance at the list of approximate latitudes on pp. 68 and 93 is of interest in this connection.

The difference in climate between the east and west coasts of America is less than between the east and west coasts of the Old World. Again, western Europe is warmer than western North America, but eastern North America is warmer than eastern Asia. The greater heat of the Gulf Stream as compared with the Kuro Siwo and the lesser width of the Atlantic help to explain these phenomena.

In consequence of this greater warmth in the west of North America, trees and grain grow at higher latitudes there than in the east.

The northern limit of trees extends from about 53° N. latitude in Labrador north-west to nearly the 70th parallel in Alaska. The area suitable for wheat is found to include the basin of the Peace River in Athabasca and British Columbia at a latitude of 57°, a northward extension of ten degrees beyond its north-eastern limit.

2. **Winds and Moisture.**—In that part of North America that lies in the Torrid Zone the prevailing wind is the Trade Wind,[1] which in crossing the warm expanses of the Caribbean Sea and the Gulf of Mexico becomes so heavily loaded with moisture that the West Indies, Central America, and eastern Mexico receive from it a very heavy rainfall,[2] and have in consequence a luxuriant vegetation.[3]

In the Temperate Zone, on the contrary, the wind comes largely from the west, the so-called Anti-Trades,[4] and brings a great deal of rain to the coast lands, especially from California northward.

Southern California receives little rain from the west winds except in winter. In summer a cold current along the coast checks evaporation, and the over-heated land offers no adequate condenser. Southern Alaska, however, is one of the most rainy regions in the world. Along the rainy portion of the Pacific slope are great forests, whose presence there is largely due to this abundance of moisture, and among the mountains are many glaciers,[5]—in the Sierra Nevada and Cascade ranges confined to the highest valleys, but in Alaska and in the northern part of British Columbia reaching down to the sea-coast and forming icebergs.

In crossing the mountain ranges that lie near the coast,[6] the wind loses so much of its moisture that the great plateau over which it next passes has very little rain.[7]

[1] See p. 39.

[2] San Jose, 65 in. per annum; Colon, 113 in.; Cordova, 112 in.; Vera Cruz, 183 in.; Jamaica, 50 to 88 in.

[3] See p. 57. [4] See p. 40. [5] See pp. 53–55. [6] See p. 52.

[7] Fort Colville, Washington, 14 in.; Salt Lake City, Utah, 16 in.; Spokane Falls, Washington, 20 in.; Boise City, Idaho, 12 in.; Yuma, Arizona, 4 in.;

An amount barely enough for agriculture falls in the basin of the Fraser and of the northern arm of the Columbia; but between the Sierra Nevada and the Rockies there is even less, and large areas with salt swamps, salty and alkaline rivers, and a soil in places saturated with salt, are results of the great dryness and absence of outlet for the streams. Irrigation[1] is necessary wherever crops are to be raised, but is practicable over a very limited area. North of New Mexico and Arizona are great expanses of sage-brush and of greasewood, plants that flourish where not much else will grow, the latter in alkaline soil, and that afford fair browsing. These plants and bunch-grass, so called because growing in scattered tufts, constitute the chief vegetation of this arid region. The southern and more torrid part is the native home of the creosote bush, with its sticky, bad-smelling leaves, and of the cactus,[2] which here reaches its greatest development, appearing in hundreds of species, some of which attain the height of sixty feet.

The highest mountains on the plateau, especially the Rockies, receive rain and snow, have forests on their slopes,[3] and contain the sources of many large rivers belonging to the Mackenzie, Saskatchewan, Columbia, Missouri, Colorado, and Texan systems.

The more northerly streams are full flooded, but those to the south, in passing through the dry regions around the mountains, lose much water through evaporation and absorption by the soil. Some, as the Platte River in Nebraska, have even less volume in their middle than in their upper courses. For, east of the Rocky Mountains, the plateau[4] has not much rain,[5] and many of the streams are saline. Irrigation is here also a necessity for agriculture, and south of 53° N. latitude trees

Fort Mohave, Arizona, 2½ in. The dryness of the Mexican plateau is similarly caused by the mountains on its eastern border.

[1] As a rule, 20 to 25 inches of rainfall in a year are required for successful agriculture without irrigation. Irrigation should be used where the average is less than 25 inches, especially where much of that which falls is lost by evaporation.

[2] See cut, p. 185. [3] See cut, p. 74.

[4] The long slope of the Rockies descends so gradually to the Mississippi River that there is no well-defined line of demarcation between the plateau area and the lower plains. Nor is there a boundary to be found in the geological formations, since strata of the same era extend from an altitude of 7000 feet in Utah to one of 500 feet in Texas. The contour line of 2000 feet elevation extends across the United States between 98° and 100° W. longitude, from near the Rio Grande to North Dakota, enters Canada near 102° W. longitude, and continues northwest to the Arctic Circle. It is nearly parallel to the main ridge of the Rockies. To the west of this line the rainfall is generally too little for agriculture, irrigation being used, while to the east it is sufficient. The sage-brush and cactus-bearing lands are also substantially all to the west. From these considerations the contour line of 2000 feet may be said to mark, as well as can be done, the eastern limit of the great western plateau.

[5] Helena, 22 in.; Bismark, 20 in.; Denver, 14 in.; Albuquerque, 8 in.

FIG. 16.—FOREST GROWTH ON THE UPPER SLOPES OF THE ROCKIES—A PASS.
(From a Photograph.)

are scarce upon it, only a few being found along the rivers. A kind of nutritious grass called buffalo-grass grows here, making these elevated plains very valuable for grazing purposes, and large herds of cattle are raised. Formerly herds of buffalo were found, but they have been nearly exterminated, except in isolated parts.

North of 53° (in Canada), on account of the cooler climate, the evaporation is not so great,[1] and the amount of rain that farther south is sufficient only for grass is able to sustain the growth of trees.

Forests of pine, firs, and other cone-bearing trees extend in a broad belt north-west and south-east between Alaska and the Gulf of St. Lawrence.

East of the plateau region the rainfall[2] is greater, especially in the southern half of the Mississippi Valley and along the Atlantic coast. From the Gulf the warm, damp winds spread over nearly all the eastern half of the United States, and even to the northern slope of the basin of the St. Lawrence in Canada, while the Atlantic coast region receives rain from east winds also. The region thus favored is the largest area in the temperate zone, with a rainfall sufficient[3] everywhere for the needs of agriculture.

A large area mainly west of the Mississippi, extending north-west into Canada and east to Ohio, is mostly grass-land, but from the 95th meridian to the Atlantic there are great areas of wood-land with forests of numerous varieties of trees, both deciduous and evergreen.

An important effect of the dry west winds on this eastern area is to cause the rapid clearing of the atmosphere after rain storms, and to diminish the amount of cloudy weather. The relatively large number of bright, clear days is a noteworthy characteristic of American climate,[4] and the increased amount of sunlight thus afforded to vegetation promotes an early ripening of the crops.

3. **Variability.**—The direction of the chief mountain chains from north to south has thus its direct effect in causing the dryness of the climate. But the absence of any east and west chain, like the Alps,[5] to ward off the cold winds from the north, has

[1] See pp. 49, 50. Compare p. 186.

[2] Winnipeg, 23 in.; Quebec, 38 in.; Fort Kearney, Nebraska, 25 in.; Austin, Texas, 34 in.; New Orleans, 45 in.; New York, 47 in.

[3] See note [1], p. 73.

[4] At Winnipeg, 47 per cent. of the days are "cloudy;" at St. Louis, 46 per cent.; at Montreal, 46 per cent.; at Philadelphia, 56 per cent.; plain of middle Germany, 65 per cent.; southern England, 70 per cent.; Vienna, 56 per cent.

[5] See p. 184. The shelter of the Alps along with other favorable influences

FIG. 17.—SCENE IN A FOREST OF GIANT SEQUOIAS ON THE SIERRA NEVADA.

another effect in allowing a wide range to the fluctuations of the temperature.

Cold winters extend far into the south, and, in exceptional years, ice may form at New Orleans or an untimely frost destroy orange trees in Florida. Cotton, which grows throughout the year in Spain, must be planted each spring in the Gulf States, although the mean annual temperature of the two regions is the same. On the other hand, warm summers are experienced far northward, and nowhere else are the regions suited to temperate and those suited to sub-tropical products comprised within so short a range of latitude.

Great changes in the weather are also a characteristic, and are noteworthy for their wide influence; a "cold wave" or a "warm wave" often being traced many hundreds of miles, and their direction is so uniformly the same that their coming is announced with certainty.

On the plateau west of the Rocky Mountains the difference between summer and winter is intensified by the dryness and altitude, and is greater than in the Mississippi Valley. The yearly average temperature, however, is higher, for the mountains keep off northerly winds, while the warm air from the south presses far northward through the openings between the short scattered ranges into the Great Basin and California. There is also a great daily variation in temperature, very warm days being followed by very cold nights.[1] The difference between noon and night at places in New Mexico and Arizona amounts to 24° or 30°, or as much as the difference between July and January at New Orleans. North-eastern Florida and western California have very equable climates. That of Florida is due to its favorable situation as a peninsula between the Gulf and the Atlantic, whence also the great luxuriance of its vegetation, which, with its abundance of flowers, might have easily been the only reason for its name.[2] The coast of California has its summers moderated by the presence of a cool current in the Pacific, and the moist westerly winds make its winters exceedingly mild.

Vegetation.—The variety of the **vegetation** of North America answers to the diversity of climate, the forms of vegetable life ranging from the stunted plants of the polar regions to the dense and towering forests of the tropics.

The flora that occupies the land north of the limit of trees is of the usual Arctic varieties;[3] lichens here form the toundra vegetation, as in Siberia, and furnish food to reindeer;[4] cranberries and whortleberries are eaten by bears and geese, but the many flowering plants[5] have few admirers of their brilliant colors.

round the Mediterranean, may be seen by comparing the climate of Washington, with a July at 78° and a January at 32°, with that of Nice, where July averages 75° and January 47°, though five degrees farther north.

[1] See p. 52, at foot.

[2] Called Florida also because discovered on Pascua Florida. [3] See p. 58.

[4] A species of lichen called *tripe de roche* is sometimes eaten by men.

[5] Red anemones, yellow buttercups, poppies, white asters, dandelions, and bluebells.

The great belt of sombre forest that stretches across Canada extends into the United States, both in the east and along its western coast and mountains. Most remarkable are the enormous **Oregon cedars**,[1] the **Douglas pine** or red fir,[2] and the giant **sequoias**[3] and redwood in California. Not only the trees, but the fruits and vegetables attain here unwonted size.

The **eastern forest area** presents a **threefold character**, the pine, spruce, and hemlock of the north gradually yielding[4] to the broad-leaved maple, oak, chestnut, ash, elm, and other deciduous trees; and these, in turn,[5] to the magnolia, live oak, palmetto, southern pine, cypress, and mangrove, with other evergreen trees that come to a fuller development in the tropical coast of Mexico and in Central and South America.

Of **cultivated plants**, tobacco, Indian-corn or maize, and potatoes are the chief that are peculiar to America. The cacao tree, bearing the chocolate bean, the vanilla vine, the cactus, and the maguey, as well as many grasses, fruits, and vegetables, were also first found here. The cotton plant and the vine were native here as well as in the Old World, cotton cloth having been made by the Aztecs.

Animals.—There are but few of the **native animals** of North America that are of great value to men, and those not as domestic animals.

Most valuable are the **fur-bearing**, the true fur-seal from Alaska, the bear, especially the white or polar bear, beaver, mink, otter, and ermine.[6]

The **buffalo**,[7] moose, elk, musk-ox, deer, mountain sheep, and other ruminants have not become the domestic animals of the continent, but are looked upon only as game, and are now found but in small numbers, and mostly in British America.

Destructive animals of the cat and dog tribes, such as panthers,

[1] Reaching a diameter of 13 feet.

[2] Sometimes 260 feet high; exported to France and England for masts and spars.

[3] These trees exist in eight groves along the western slope of the Sierra Nevada, between latitudes 36° and 38° north. The groves are all small, their total area amounting to 30 or 40 square miles. Specimens 325 feet high and 45 feet in diameter are recorded. The redwood or evergreen sequoia grows in extensive forests. (See p. 76.)

[4] Till about latitude 42° N.

[5] Lat. 36° N. is called the northern limit of the southern varieties.

[6] The Hudson Bay Company had for many years almost complete control of the fur trade in Canada, and endeavored even to prevent settlements that would reduce the area of forest land.

[7] The skins of buffalo, with thick brown hair, have wide use as sleigh-robes and heavy blankets. Their flesh prepared with beef fat is the "pemmican" of the fur-hunters. Buffaloes have been domesticated in the United States, but only in small numbers and as an experiment.

FIG. 13.—A SEAL DRIVE.

jaguars, ocelots, lynxes, wolves, and wolverines, have been vigorously hunted, bounties being offered for their slaughter, and are now seldom seen even in the wildest parts. Tapirs, monkeys, sloths, and ant-eaters occur in Mexico and Central America, but are more abundant in South America. The alligator is found around the Gulf of Mexico, and is now much hunted for its skin. Of birds there is a great variety in form, color, and voice. **Humming-birds** are exclusively American, and also the **turkey**, now domesticated. Great numbers of migratory birds spend their summers in Canada or the United States, returning southward in the fall, some even to Mexico and Central America. The famous canvas-back duck thus migrates between Chesapeake Bay and the Yukon River.

Of **fish** there is a great abundance, both of fresh and sea-water varieties. The Banks of Newfoundland and St. George's shoals are feeding-grounds for **cod**. Halibut, mackerel,[1] herring, and blue fish are caught along the coast, and shad in the various rivers, up which they go to spawn.

Along the Gulf of Mexico are mullet, sea-turtles, and crabs. The **salmon** from the Columbia, Fraser, Sacramento, and other Pacific rivers are highly prized, and sent to all parts of America and Europe. The Great Lakes contain the **white fish**, which are carried fresh in refrigerator cars to places far distant, as are also **oysters** from Chesapeake Bay.

Of the pests, the grasshopper, the potato-bug or Colorado beetle, the cotton-worm, the Hessian fly, and the army-worm may be mentioned. The cochineal-bug is, in Mexico and Central America, the source of a valuable red dye. The silkworm has been introduced into California.

The domestic animals, horses, mules, cattle, sheep, and swine, are none of them native to America.

Minerals.—Of the **mineral wealth** of North America gold and silver exist most abundantly in the region of the western highland, and all countries of the continent share in their possession. They constituted the first attraction to the Spanish adventurers, and the Spanish possessions were mostly those regions containing the precious metals.[2] The great deposits of coal and iron are found more largely in the eastern part of the continent, but all the countries share in these also, and nearly all in petroleum, copper, and salt.

Quicksilver, which is a necessary aid in obtaining gold or silver,

[1] Spanish mackerel, herring, halibut, and cod are found both in Pacific and Atlantic coast waters.

[2] The total production of gold and silver in the world from 1493 to 1875 has been estimated at 10,802 million dollars, of which Mexico furnished 2730 millions, mostly silver, and the United States 1175 millions, mostly gold. South America also furnished 3900 millions, so that America contributed about three-fourths of all the gold and silver in these years. The yearly production of silver in the United States is now greater than that of Mexico.

is found abundantly in Mexico and California; while lime, so necessary to the manufacture of iron, exists throughout the east.

Population.—The population of North America is, in round numbers, about 87,000,000, of which $4\frac{8}{10}$ millions are in Canada, $62\frac{6}{10}$ millions[1] in the United States, $11\frac{4}{10}$ millions in Mexico, $5\frac{3}{10}$ millions in the West Indies, and $3\frac{1}{10}$ millions in Central America.[2]

The number of persons to a square mile is still very small, both as compared with the eastern continents[3] and in proportion to the capacity to support life, it being estimated that the Mississippi Valley alone could sustain 200 to 300 millions.

The states of **Massachusetts, Rhode Island, Connecticut,** New York, and Pennsylvania are **the most densely populated parts** of temperate North America,[4] but these sections are exceeded in density by some of the smaller of the West Indies.[5]

The population may be said to consist in general of four elements—Caucasians or whites, Indians, half-breeds, and negroes.[6]

Indians, originally occupying all the land, now constitute less than one per cent. of the population outside of Mexico and Central America.

In these two sections, however, where their civilisation[7] was not so far inferior to that of their European conquerors as elsewhere, they now largely surpass all other classes in numbers; out of 13 million inhabitants, over 6 million are pure Indian, and over 4 million are of mixed race.

In the West Indies, where **negroes** were early held as slaves,[8] they now form two-thirds of the population, while in the United States they number over seven millions.

Nearly the whole of the **white population** (about 95 per cent.) is in the United States and British America, the number in Spanish North America[9] being only about 3 million of Spanish origin.

Three nations—the British, the German, and the French—

[1] The census of 1890 shows 62,622,250 inhabitants in the United States.

[2] Compare with these numbers New York State, with a population of 6 millions. See also pp. 187, 331, and 370.

[3] See p. 370.

[4] In 1890 Massachusetts had 269 persons to a square mile; Rhode Island, 276; Connecticut, 149; New York, 122; Pennsylvania, 116.

[5] Porto Rico has 227 persons to the square mile; Barbadoes, 1571. See also p. 370.

[6] Between two and three hundred thousand Chinese are in the United States, British Columbia, and West Indies, of whom about 100,000 are in the United States.

[7] See pp. 65, 66.

[8] See p. 167.

[9] The West Indies, Mexico, and Central America, where Spanish is spoken, are sometimes so called.

have furnished the stock from which the Americans and Canadians of to-day are chiefly derived. Nearly every other people of Europe has also contributed a quota, the Dutch with especial effect, but the three above have been the leading ones; and of these it is the British whose law, customs, language, and religious observances have most widely and fundamentally prevailed.

Until 1664 the British possessions in America were in two parts, separated by the Dutch colony of New Netherlands, which extended from the Connecticut River to Maryland. In that year New Amsterdam became New York. In 1713 the French yielded Newfoundland, Acadia, and the Hudson Bay Territory. 1763 saw the remainder of Canada and the French possessions east of the Mississippi[1] added to the British area. By the treaty of 1783 the thirteen colonies became independent; but the inhabitants of the United States did not long remain content with their boundaries as then established. In 1803 the remaining French territory, called Louisiana, was purchased, and the whole Mississippi Valley was then the property of the United States. Spain ceded Florida in 1821; Texas was admitted in 1846; the war with Mexico that followed resulted in the addition of more than 500,000 square miles to the Union in 1848, and in 1853, by the Gadsden Purchase, the southern half of the Gila valley was added to this.

The land west of the Rocky Mountains, between the 42nd parallel and Alaska, claimed by both Great Britain and the United States, was divided between the two Powers in 1846 by the Oregon Treaty, the 49th parallel being made the boundary.

The purchase of Alaska from Russia in 1867 completed the territorial acquisitions of the United States, and the whole of the continent from the Arctic Ocean to Mexico is now controlled by peoples speaking the same language and having a common origin.

In that part of the continent where Spanish is spoken, the rule of Spain was established mainly by the conquests of Cortez and his followers, and for 300 years New Spain poured forth treasure for the Spanish crown.

In 1821 Mexico established its independence and two years later became a republic; and in the same year Central America, which had been divided into five governmental provinces, broke away from the mother country, and in 1828 became the United States of Central America. This republic, however, separated into five in 1839, Guatemala, Honduras, Nicaragua, Salvador, and Costa Rica, which still maintain their separate existence in spite of many attempts to unite.

By right of discovery, by occupancy, by seizure, and by purchase, Spain, England, France, Holland, and Denmark possess various of the West India Islands, while one, Hayti, has become independent.

Greenland, discovered and settled by the Norsemen in the tenth century, was abandoned and forgotten in the fourteenth. Rediscovered by Davis, it was again occupied, this time by the Danes, as Norway had, in 1387, fallen to the Danish crown.

[1] Except a small part of Louisiana, including New Orleans.

COMPARATIVE TABLE OF NORTH AMERICAN STATES.

	Area.		Population in Thousands.	Government.	Language.	Religion.
	In Thousands of Sq. Miles.	Comparative.				
Greenland	850[1]	... ...	10	Danish colony.	Danish and Eskimo.	Protestant.
Canada	3,406	United States, less California and New Mexico.	4,829	Dominion.	English and French.	Protestant & R. Catholic.
Newfoundland	43	Tennessee.	198	British colony.	English.	Protestant & R. Catholic.
United States	3,602	Europe, less Scandinavia and Greece.	62,622	Republic.	English.	Protestant & R. Catholic.
Mexico	767	All States bordering the Ohio and Mississippi Rivers.	12,056	Republic.	Spanish.	R. Catholic.
Guatemala	47	Mississippi.	1,800	Republic.	Spanish.	R. Catholic.
Honduras	46	Pennsylvania.	396	Republic.	Spanish.	R. Catholic.
Salvador	7	New Jersey.	803	Republic.	Spanish.	R. Catholic.
Nicaragua	49	New York.	380	Republic.	Spanish.	R. Catholic.
Costa Rica	20	Vermont, Massachusetts, and Rhode Island.	248	Republic.	Spanish.	R. Catholic.
Blize, British Honduras	7	Connecticut, Rhode Island, and Long Island.	31	Colony.	English.	Protestant.
Spanish West Indies	47	Louisiana.	2,328	Colonies.	Spanish.	R. Catholic.
British West Indies	13	Maryland.	1,362	Colonies.	English.	Protestant.
French, Dutch, and Danish West Indies	1½	Rhode Island, Nantucket, and Martha's Vineyard.	F. 341 D. 45 Da. 33	Colonies.	French. Dutch. Danish.	R. Catholic. Protestant.
Hayti and San Domingo	29	South Carolina.	1,570	Republics.	French. Spanish.	R. Catholic.

[1] Only 34,000 square miles of Greenland are free from ice=Maine.

COUNTRIES OF NORTH AMERICA.

1. GREENLAND AND THE ARCTIC ARCHIPELAGO.—Greenland is a large mass of land or group of islands (it is uncertain which), almost completely buried under ice, which reaches in some parts to at least ten thousand feet above sea-level, and which in the numerous fiords[1] of the coast has its ends broken off to form icebergs.[2] The east and south coasts are difficult of approach on account of the pack-ice by which they are constantly fringed, and the only settlements therefore are upon the west coast. These belong to the Danes.

The inhabitants are mostly **Eskimo**, who live, like their unsettled kinsmen of the more northerly parts of Greenland and on the north coasts of the mainland of America, chiefly by seal and whale fishing, pursuing these animals in peculiar boats called *kayaks*. Between Greenland and the Arctic Archipelago lies **Baffin's Bay**, with **Smith Sound** and its continuations, by means of which the nearest approach has yet been made to the North Pole.[3] Only one or two of the islands of the Archipelago are inhabited (by Eskimo). Between them a **North-west Passage** to Eastern Asia was sought for centuries in vain, and, though discovered by M'Clure in 1853, it is too encumbered by ice to be of any use for commerce.

2. BRITISH AMERICA.—A. The Dominion of Canada, north of the United States, from which it is separated partly by the middle line of the four northern great lakes, partly (west of the Lake of the Woods) by the parallel of 49° N. It embraces a territory upwards of three millions of square miles in extent, but the populous portion of this vast area is confined to the region bordering the St. Lawrence and the lakes, and embraced between the eastern shore of Lake Huron and the meridian of the city of Quebec.

The lake peninsula which lies between Lake Huron on the one side, and Lakes Erie and Ontario on the other, has an area of less than 20,000 square miles, and yet contained in 1881 about two-sevenths of the entire population of the Dominion,[4] and the smaller area south of the St. Lawrence and west of Quebec had about one-eleventh of the whole. The whole of the populous area lies at least two degrees farther south than

[1] See p. 257. [2] See Introd., pp. 54–5.

[3] By the British expedition under Nares in 1876, 83° 20′ N.; by the United States expedition under Greely in 1883, 83° 24′ N.

[4] The density of population in this peninsula was about 65 to the square mile —somewhat less than that of Ohio, but greater than that of Illinois,

the southernmost point of England, but from two to six degrees farther north than Manchuria, which may be considered the corresponding region of Asia. (See p. 289.)

The **surface** is generally low-lying east of the Rocky Mountains, and **toundras** similar to those of northern Russia and Siberia cover large tracts in the north, descending in the east to the southern shores of Hudson's Bay, and still farther east along the whole coast of Labrador. There next follows a region of vast **forests**, chiefly of pines and firs, amongst which the principal products in the north-west are, as in the corresponding latitudes of Russia and Siberia, **furs**, and in the south-east **lumber**, huge rafts of long timbers being floated down the smaller streams to the larger ones, the Ottawa and St. Lawrence, and by these to Quebec, whence it is exported to Europe and elsewhere. Much sawed lumber is sent to the United States by rail.

South of the forest region there lies in the west, between the Rocky Mountains and the Great Lakes, an area of level plains or gently rising table-lands almost destitute of trees, but well grassed in most places. These plains contain tracts of the highest importance for the future development of the Canadian Dominion. Though part of this area is covered with a barren soil which forbids all hope of cultivation (at least for many years to come), there are still larger areas, chiefly along the **Red River** (which enters Lake Winnipeg from the south) round **Lakes Winnipeg** and **Manitoba**, and in the valley of the **Saskatchewan**, where the soil is of the richest description, and the climate, though subject to great extremes, is admirably adapted for agriculture. Two feet of snow may cover the ground during the winter, but the warm summers are sufficient to ripen wheat in three or four months.

The average number of bushels of wheat to the acre grown on these rich soils with very little manure is about twenty, an average higher than in any other country for which statistical information is obtainable except England. **Coal** also is among the products of this region, and is already worked at more than one place.

For the development of this region, so remote from the markets of Europe, the natural **water-ways** of the Dominion are of the highest importance. From the mouth of the St. Lawrence, it is possible for ships to ascend, with the aid of a few canals, to the head of Lake

Superior, and thence with little interruption the journey by water may be continued by **Rainy Lake** and **River**, and **Winnipeg Lake** and **River**, to the head-waters of the Saskatchewan, a distance of 4500 miles in all. One of the interruptions to navigation (avoided by a canal) on this system of water-ways is formed by the **Falls of Niagara**, at which a river more than half a mile wide, forming the connection between Lakes Erie and Ontario, is precipitated over a cliff upwards of 150 feet in height Railways have been laid where water communication does not exist, and the aid to transportation afforded by the Canadian Pacific Railway is sure to have an important effect on the prosperity of this

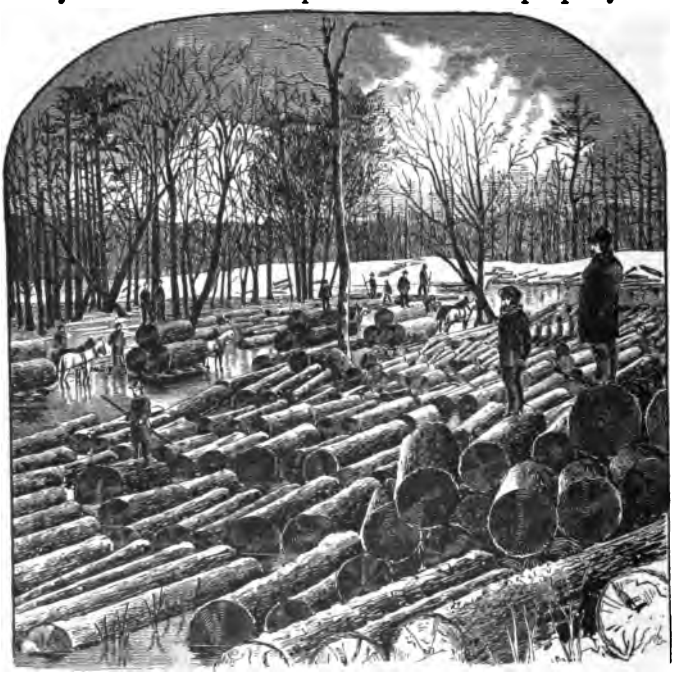


FIG. 19.—A LUMBERING SCENE.

region. The northern rivers of Canada, the **Mackenzie**, **Peace**, and **Athabasca**, and **Great Fish River**, have their course interrupted by too many rapids and falls to be of much use as water-ways, but this is of less consequence since they empty themselves into a scarcely accessible sea. It is a more serious disadvantage that the **Nelson River**, the outlet of Lake Winnipeg to Hudson's Bay, has its navigation interrupted in the same way (except for 100 miles above its mouth), for the navigation of that wide inlet, though difficult, is believed to be practicable, and this route is the shortest from Liverpool to the Canadian north-west.

The construction of a railway from Winnipeg to a port on Hudson's Bay has accordingly been commenced.

The **people** of Canada are **mainly of British origin** and Protestant in religion; but French Roman Catholics make up about one-third of the population, chiefly in the east (Quebec, &c.), those regions having been originally colonised by the French, from whom they were gained by the English in 1759. There are about 100,000 **Indians**, most of whom are hunters roaming over the forest regions of the north-west, and living by the sale of furs to the fur-trading companies. With the view of encouraging emigration and promoting the development of the fertile areas in the west, the Government of the Canadian Dominion gives a free grant of 160 acres of land to settlers who undertake to reside on the land and prepare it for cultivation.

The Dominion, though having a general government and parliament for the common affairs, is divided into a number of provinces, each of which has a parliament of its own, to deal with matters of local interest, but there is a large territory on both sides of Hudson's Bay which is not so organised. The seat of the general government is **Ottawa (44)**,[1] in the province of Ontario, at the confluence of the Rideau River with the Ottawa,[2] about ninety miles above the confluence of the latter with the St. Lawrence. It is the center of the lumber trade of the province in which it lies.

Provinces and Towns.—(1.) **Nova Scotia** (in the time of the French *Acadie*), a province including both the peninsula of that name and the island of **Cape Breton** in the north: in all, about two-thirds of the size of Maine. Its fertile land, less than half the entire area, is mainly situated in the interior. The **valley of Annapolis** is the most favored district in point of soil and climate, and is above all noted for its apple-orchards. The province is rich in **coal** and other minerals, and has extensive fisheries.

The capital is **Halifax** (39), on the **east coast**, at the end of a fine natural harbor, which is the chief naval station of British North America, and being in most years free from ice all the winter through, makes Halifax the chief winter port of Canada. The city and harbor

[1] Numbers in parentheses are used to indicate population in thousands, Ottawa, 44,000.

[2] See p. 61 (2) (*a*).

are defended by fortifications, and Halifax is the only place in the Dominion at which British troops are still stationed.

(2.) **Prince Edward Island**, somewhat greater than Long Island in size, in the Gulf of St. Lawrence, between New Brunswick and Nova Scotia. From the nearest point of New Brunswick it is distant nine miles.

Charlottetown (11), the capital, on a large, deep, and well-sheltered harbor, which nearly divides the island in two, exports fish and farm produce.

(3.) **New Brunswick**, rather less than Maine in size, very rich in forests, which furnish more than half of the value of the exports of the province. The fisheries are also valuable.

The capital is **Fredericton** (6), a small town in the interior, at the head of navigation for steamers on the St. John River, but the largest town and chief seaport is **St. John** (39), occupying a fine harbor on the Bay of Fundy at the mouth of that river. This harbor is open all the year round.

(4.) **Quebec**, on both sides of the St. Lawrence, mostly east of the Ottawa, nearly three times the New England States in area, but the population of which is mainly confined to the small area above indicated (p. 84). The winter is long, snow generally covering the ground from December to April. During this long period labor is largely turned to account in lumbering. The frozen state of the ground and the rivers and the abundance of snow are also an advantage in transporting the logs to the streams, down which they will float in the spring. (See p. 53.) The summer, on the other hand, is warm enough to grow even corn and tobacco, but oats, together with potatoes and hay, are the leading crops. The iron of the province and coal from Nova Scotia are used in manufacturing.

The capital of the province is **Quebec** (63), the head-quarters of French Canada,[1] one of the oldest cities founded by Europeans on the North American continent. It is situated at the junction of the Charles River with the St. Lawrence,[2] partly on the top of a commanding promontory. Once the head of navigation for large vessels, it has had its growth checked by the deepening of the river above the town, and by other causes. **MONTREAL** (216), situated on an island, nearly 200 miles (by river) higher up the St. Lawrence, can now be reached by vessels of 3000 tons burden; and as the Lachine Canal, which avoids the principal rapids of the St. Lawrence, begins immediately above the port of Montreal, and admits no vessels drawing more than 12 feet, this port is the present head of navigation for the larger class of ocean-steamers.[3] Here

[1] The capture of Quebec by General Wolfe in 1759 secured for the English the possession of French Canada. [2] See p. 61 (2) (*a*). [3] See p. 61 (1) (*b*).

FIG. 20.—QUEBEC. (From a Photograph.)

accordingly most of the produce of the west is brought by rail or by smaller lake and river vessels for shipment during the period when the St. Lawrence is free from ice; and Montreal is consequently a prosperous seaport, with a rapidly increasing population.[1] The port of Montreal is closed by ice, as a rule, from about the beginning of December to the end of April, during which time much of its commerce is carried on through Portland, Me. A railway bridge nearly two miles in length connects Montreal with the right bank of the St. Lawrence.

(5.) **Ontario**, about equal in area to Michigan and Minnesota, is the province to the west of Quebec, extending along the north of the great lakes. The populous region, which is the most southerly part of the whole of the Dominion, has a much shorter winter than that of Quebec, and in the extreme south, through the favorable influences of Lake Erie upon the climate, even **wine** is grown. In this province **barley** is an important crop, and it is the only grain which is exported in large amount from Canada to the United States. Iron and copper are mined, but the lumber interest predominates.

The capital is **TORONTO**, near the west end of Lake Ontario, on which it has a fine harbor. It is growing as rapidly as Montreal, and though its population at the census of 1881 was under 90,000, it is estimated to have increased to about 189,000 since that date. Another thriving town is **Hamilton** (49), at the extreme west of the same lake. **Kingston** (19), near the outlet of the same lake, is the terminus of a system of navigation which allows of small vessels reaching Ottawa partly by canal and partly by the River Rideau. The chief inland town is **London** (32), about midway between Lakes Erie and Huron. **Port Arthur**, on the northern shore of Lake Superior, is the terminus of the lake navigation in the Dominion of Canada, and is the place at which the Canadian Pacific Railway leaves the shore of Lake Superior.

(6.) **Manitoba**, the rich, flat, **wheat-growing province** in the west, is about two-thirds of the size of Minnesota. It encloses the lake of the same name, and the greater part of Lakes Winnipeg and Winnipegosis.

The capital is **Winnipeg** (25), situated at the confluence of two navigable rivers,[2] the Red River (p. 85), which flows northwards from the United States, and the Assiniboine, which comes from the west.

(7.) **British Columbia**, nearly two-thirds the size of Alaska,

[1] Its population in 1881 was 141,000; in 1861, 90,000; while that of Quebec was in 1881 only 62,500, as against 60,000 in 1861. Since 1881 the population of Montreal has increased to above 200,000, but this is partly in consequence of the incorporation of smaller towns adjoining.

[2] See p. 61 (2) (*a*).

FIG. 21.—THE PLAIN OF WESTERN CANADA, NEAR CALGARY—CREE INDIANS.
(From a Photograph.)

occupying the dry table-land of the Rocky Mountains, with the moist mild strip of coast (p. 85), and the islands to the west. The principal wealth of this province consists in its minerals and forests. The discovery of **gold** first brought a rush of settlers here in 1856.[1] There are important **coal-mines** on Vancouver Island. The **forests** on the western or Coast Range of the Rocky Mountains, composed of gigantic pine and fir trees, are among the grandest in the world.

The capital is **Victoria** (17), on a beautiful harbor at the south-east end of Vancouver Island. **Nanaimo** (5) is a coal-mining town and seaport on the east coast of this island. **New Westminster** (5), near the mouth of the Fraser River, and **Vancouver** (8), on Burrard Inlet, are the two western termini of the Canadian Pacific Railway.

The North-West Territories and the Provisional Districts.—The area to the west of Hudson's Bay and the province of Manitoba as far as the frontier of British Columbia is known generally as the North-West Territories. It contains as yet but a small settled area, but settlement is going on along the line of the Canadian Pacific Railway and the course of the northern branch of the Saskatchewan[2] River, which is navigable by steamers to Edmonton, about 113½° W. Four areas have been marked out under the name of provisional districts. These are (1) **Assiniboia**, to the west of the southern part of Manitoba; capital, **Regina**. (2) **Saskatchewan**, north of Assiniboia. (3) **Alberta**, to the west of both the previously named districts; capital, **Calgary**, finely situated at the meeting-place of two streams at the base of the Rocky Mountains. Having rich grasses, this district is pre-eminently the cattle and dairy region of western Canada. (4) **Athabasca**, north of Alberta, not yet settled. The name of **Keewatin** is given to an unsettled district to the north of Manitoba.

B. Newfoundland, a separate colony, to which also belongs the dreary and scarcely inhabited Atlantic coast of **Labrador**. The island is about as large as Maine and New Hampshire. It may be called the Yezo of North America, though situated about six degrees farther north than that island.[3] Like Yezo, it is washed by a cold current on the east, which brings with it a great abundance of food-fishes,[4] and the inhabitants are chiefly fishermen, settled on the coast. The cod-fisheries on the Bank of Newfoundland, a shallow to the east, are the largest in the world. They are carried on in summer and autumn. The seals of Newfoundland are also extensively hunted. Trinity Bay, on the south-east coast, is the terminus of several telegraphic cables. Capital, **St. John's** (30), on the east coast.

C. The Bermudas, a group of small islands about 750 miles south of Nova Scotia, producing tropical and temperate fruits, and frequented by invalids for the sake of their equable climate.

[1] Comp. California, p. 126, and Australia, p. 354.

[2] Pronounce *Sas-kat'-che-wan*.

[3] See below, p. 329.

[4] See Introd., p. 49.

3. UNITED STATES.

Approximate latitudes: Sitka (Aberdeen, Nizhni-Novgorod), 57° N.; Olympia (Quebec, Nantes), 47°; St. Paul (Montreal, Venice), 45°; (Hakodate), Salt Lake City, New York (Naples, Constantinople, Khiva), 41°; (Niigata), San Francisco, Richmond (Athens), 38°; (Yohohama), Memphis (Kabul), 35°; (Hangchau), New Orleans (Cairo, Lhassa), 30°.

Approximate longitudes: Eastport, Me., 67° W.; Boston (Santiago), 71° W.; Mouth of Mississippi, 89° W.; Pike's Peak, 105° W.; coast of Oregon, 124° W.

Position and Size.—The United States occupy the central portion of North America, together with its north-west peninsula of Alaska, in all, very nearly one-half the mainland of the continent. The position of its main area is one that combines important advantages.

Climatically it is entirely within the temperate zone, and so in no part uninhabitable. For commerce it is so situated that, while its Atlantic ports lie opposite the densely-populated lands of Europe, its western harbors are easily reached from the most populous countries across the Pacific, and already a few Asiatic products, which formerly reached America by way of Europe from the East, are now being carried thither across the Pacific.

From a political point of view it has been of advantage that the United States were far enough from the Old World to develop successfully a republican form of government, and to be practically unaffected by the wars and other disturbances that have occurred there. Instead of separate nations growing up in the areas that were added,[1] three and a half million square miles[2] are occupied by one nation, whose territorial area is thus the fourth in the world.[3]

Outline.—The **boundaries** are mostly natural, and those parts that are artificial, as along the 49th parallel, west of the Rio Grande, or east of Alaska, pass through areas with but scanty population.

[1] See sketch of territorial increase on p. 82.

[2] 3,602,990, including Alaska.

[3] Three empires are larger: the British, $3\frac{1}{6}$ times as large; the Russian, $2\frac{2}{5}$; the Chinese, $1\frac{1}{4}$. Brazil is fifth in size, with 3,218,000 square miles. Australia is nearly equal to the United States without Alaska. Europe, with 3,786,000 square miles, is larger.

The high and rocky western coast, from the 49th parallel to the Mexican boundary, has but three indentations that reach through the coast range into the fertile valleys to its east.

1. **Puget Sound,**[1] in Washington, extends southward about 75 miles from the inner part of the Strait of Fuca. Its steep shores, heavily wooded with dark forests of fir and pine, the numerous islands, and the many narrow inlets or fiords, combine with the snow-capped peaks of the Cascade Range to form a region strikingly similar to the western coast of Norway, and the rainy climates of the two regions carry out the resemblance. The deep waters afford harbors to the largest vessels, on which account the Northern Pacific Railroad has made here its western terminus at Tacoma, so that grain from Idaho and Montana, as well as the products of the region about the Sound, is brought here for export.

2. **The Columbia River,** six miles wide at its mouth, with its southern tributary, the Willamette, affords navigation for ocean-steamers up to Portland, 112 miles from the sea. The completion of the canals now being made around the cascades of this river will establish uninterrupted inland navigation for several hundred miles farther, and thus increase the importance of this port.

3. The **Bay of San Francisco** is the third of these larger indentations; its southern arm lies in a depression between two ranges of the coast mountains, while its northern arm, known as San Pablo and Suisun Bays, extends eastward through the inner range, and receives the navigable Sacramento and San Joaquin Rivers. Through this break in the coast mountains the cool sea-wind reaches the interior valley, and gives San Francisco and places directly east of it a lower summer temperature than others north or south.[2] Opening to the ocean by the narrow Golden Gate, San Francisco Bay has much the character of an inland sea, while its great size, depth, and commanding position for both inland and oceanic commerce have made the city the terminus of three trans-continental railroads and the central point for Pacific shipping.

Two bays on the south-west coast of California, San Pedro and San Diego, though not large, are important because they are situated opposite a depression in the coast mountains, the San Gorgonio Pass, through which the Southern Pacific Railroad first reaches the coast region.

Several other bays (Monterey, Humboldt, Shoalwater) are capable of being used by coast-shipping.

[1] The name Puget Sound belongs properly to the southern part only of this watery labyrinth. Admiralty Inlet connects the sound with the strait. Hood's Canal occupies a depression over 60 miles in extent, and there are a dozen or more inlets, bays, and channels enclosing several islands. The total shore-line from the entrance of the strait is said to measure 1600 miles.

[2] July's average temperature at Marysville, 78°; at Sacramento, 72°; San Francisco, 59°; Fort Miller, 87°. In October, when the interior valley has become cooler and the "keyhole" breeze does not blow, the temperature at San Francisco is higher than it was in July.

The boundary from the Pacific coast to the Gulf begins at a point one nautical mile south of the southern end of the San Diego Bay, and terminates at the mouth of the Rio Grande. It is practically a natural boundary, as the line from the starting-point to the Colorado passes along the southern edge of the Colorado Desert, and the line from the Colorado to the Rio Grande is drawn along the divide between the Gila basin and the rivers of Sonora and Chihuahua.

The **coast** along the **Gulf of Mexico** and the **Atlantic**, as far north as New York Bay, is low and sandy, in striking contrast to the steep and rocky shores of the Pacific. Here there are no mountain ranges near the coast, but broad alluvial plains, from 50 to 300 miles in width, form the border of the continent, and are gradually being extended into the shallow coast-waters by the deposit of the sediment carried down by the rivers.

Great areas of swamp land extend with intervals from Texas to New Jersey, and the coast is fringed with low sandy islands formed from sediment and bordering shallow sounds and lagoons.

The largest of the indentations are the **Delaware** and **Chesapeake** Bays, **Albemarle** and **Pamlico Sounds**. The two bays are deep[1] and commodious, and contain many important ports, among them Philadelphia and Baltimore, each a terminus of a trunk-line railroad. The many rivers emptying into Chesapeake Bay are, in their lower courses, practically arms of the sea, and make Maryland and Virginia accessible to ships at many points. The two sounds, and the many other sounds and bays, are for the most part shallow, and sand-bars lie across their entrance, as also at the mouth of many rivers on this coast.

The Mississippi River, Mobile Bay, and Pensacola Bay, St. Simon's Sound, and the harbors of Savannah, Charleston,[2] and Wilmington, N.C., are easily entered, but at most ports large ships must have a part of their cargo discharged or loaded with the help of lighters.

Formerly the bars at the mouths of the Mississippi River prevented or greatly hindered the entrance of large ocean-going vessels, but since one of its mouths, the South Pass, was artificially narrowed by **jetties**,[3] the current has scoured out the bottom and established a deep safe passage.

[1] The *Great Eastern*, the largest steamship yet built, steamed up to Philadelphia.

[2] The most important harbor between New Orleans and the Chesapeake.

[3] Planned and built under the supervision of Captain James B. Eads. The artificial deepening of harbors and rivers is constantly in progress, money being usually appropriated each year by Congress for that purpose by a "River and Harbor Bill."

New York Bay forms the most important harbor in America.

It consists of two parts, the lower or outer bay, and the upper, inner bay, which are connected by the Narrows, a strait between **Staten** and **Long Islands**. The broad and deep **Hudson** or **North River**, on the west of **Manhattan Island**, and the **East River**, a strait on the east side leading to **Long Island Sound**, are also parts of the real harbor, and contain nearly all the docks at which vessels load. The bays contain the chief anchor-grounds of the harbor.[1]

New York harbor receives tides from two directions—through the Narrows and from Long Island Sound through East River. Tides rise in the sound on the average 2½ feet higher than in the bay; hence a surplus of water pours through East River and out at the Narrows, and together with the water from the Hudson prevents the filling of the harbor with sediment. At New York the sandy coast comes substantially to an end. On the south of Long Island, however, are many "beaches" with summer resorts, and the Cape Cod peninsula is of the same formation.

The coast of New England becomes more and more rugged and broken towards the east, and its harbors are numerous and good. The coast of Maine is so indented with narrow fiord-like bays that the total length of the shore-line is nearly 2500 miles, although the Salmon Falls River is less than 225 miles distant from the St. Croix.[2]

Numerous rocky islands (**Mount Desert**) increase the picturesqueness of the scenery, which combines with the invigorating sea-breezes and moderate climate to make this a great summer resort; while shipbuilding, fishing, and commerce are natural occupations of the inhabitants.

Narragansett Bay with the well-protected Long Island Sound form the route of much of the traffic between New York and Boston, for which **Providence** and **Fall River** are the points of trans-shipment.

Buzzard's Bay with **New Bedford** has long been famous for its whaling fleets, and the near-lying **Martha's Vineyard** and **Nantucket Islands** are renowned for their healthful climate. In **Cape Cod Bay** the *Mayflower* first cast its anchor. **Massachusetts, Casco**, and **Penobscot Bays** are deep and spacious, the former containing **Boston Harbor**, one of the best of America.

Portland, on Casco Bay, is the winter terminus for the Grand Trunk Railway of Canada, Montreal becoming inaccessible by steamers in winter on account of ice.

The boundary-line between the United States and the British Possessions is the result of several treaties between the two Powers, the last determining the course through the Strait of Fuca. The small extension north of the 49th parallel was due

[1] The anchor-place for foreign war-vessels is in North River.

[2] Compare note on Puget Sound, on p. 94.

to the wrong belief that a line drawn due west from the outlet of the Lake of the Woods would meet the Mississippi River.

Surface.—As the chief mountain systems, plateaus, and plains of North America extend north and south, the United States in its extent across the continent from east to west includes a portion of each of the great surface features, its **western part** consisting of the central and broadest part of the extensive series of **plateaus** that, with numerous and lofty mountains, form the highest portion of the continent, while its **eastern half** is the southern part of the broad **lowland plain,** broken only by the comparatively low rolling ranges of the Ozark and Appalachian Mountains.

The contour-line of 2000 feet that extends from the Rio Grande in Texas to the Canadian border of North Dakota, usually between 98° and 100° W. longitude, divides the land area into two sections of about 1,500,000 square miles, each. Out of a total area of 1,333,000 square miles of land having an elevation of 2000 feet or more, only 20,000[1] square miles are in the eastern half; and of 1,648,000 square miles below 2000 feet elevation, only 142,000[2] square miles are in the western half.

The two parts differing thus in elevation are much unlike also in climate, vegetation, and mineral resources, and consequently in the occupations of their inhabitants.

The more elevated west, with a dry climate and a scanty forest area, is, as a whole, better adapted for grazing than for agriculture, while its chief mines are those of the precious metals. Coal and iron are the chief minerals in the east, and the abundant rainfall makes its plains everywhere suitable for farming, and nourishes extensive forests.

I. The Western Highland.—This comprises an area of about one and a half million square miles, the plateau portions of which are elevated to a height of from 1000 to 12,000 feet above the sea-level, the average elevation being about 5000 feet. As the average height of the Appalachians is but 2500 feet, and that of their highest peaks not 7000 feet, it is seen that the land west of the 100th meridian is, as a whole, **higher than the eastern mountain ranges,** while large areas of it are higher than the top of Mount Washington or Black Dome.[3]

[1] Mostly in Georgia, Tennessee, North Carolina, Virginia, and West Virginia.
[2] Mostly in western Washington, Oregon, and California.
[3] Mount Washington, 6293 feet; Black Dome, 6707.

The numerous ranges of mountains of the western plateau region (probably 200 ranges could be named), form a part of the **Cordilleras** of North America, which have here their greatest east and west expansion, though not their greatest height.[1] These ranges have, with few exceptions, a north and south trend, and their elevations are of from 3000 to upwards of 14,000 feet. The highest and most massive ranges occur in two systems, that of the **Rocky Mountains**, a little east of the middle of the plateau, and the system near the western edge, known only by the names of its several ranges, the **Sierra Nevada**, the **Cascade**, and the **Coast Ranges**.

That portion of the highland that lies between these two systems is known as the **Plateau Belt**; the portion to the east of the Rockies is called the **Great Plains**.

The **Rocky Mountain System** occupies the highest part of the plateau, and constitutes or contains the water-parting between the rivers that flow to the Pacific and those that flow to the Mississippi and the Gulf of Mexico.

The ranges of this system have a parallel arrangement, there being usually an eastern and a western range, between which are broad elevated valleys. There is no one range continuous from north to south across the whole country, but there are instead several irregular sections separated by river valleys and crossed by many passes. From the Canadian border to the Laramie Plains in southern Wyoming the system extends southeast, crossing about ten degrees of longitude, and here the ranges are widely apart and in open order, while from Wyoming southward they have a more meridional direction and are near together.[2]

In the north are the **Missouri Mountains** and the **Bitter Root Range**, between which are numerous short ranges and many fertile valleys, the most valuable portion of Montana. Here rises the **Clark Fork** of the Columbia, while on the plateau, which lies south of the end of the

[1] The highest peaks are in Mexico and in Alaska. Popocatepetl, nearly 18,000 feet; St. Elias, 15,350. In the United States proper:—Mount Whitney, in Sierra Nevada; Mount Rainier, in Cascade Range; Pike's Peak, in Front Range; Mount Harvard, in Sawatch Mountains, all between 14,000 and 15,000 feet high.

[2] This arrangement obtains also in the Andes. The ranges of Asia, crossing many meridians, are arranged similarly to those of the section from Wyoming to Canada.

Missouri Range, are the headwaters of the **Missouri**, of the **Yellowstone**, and of the **Snake**.

This plateau is of peculiar interest, since here is a display of Nature's forces in geysers and hot springs, so remarkable that Government has reserved a large surrounding tract as the **Yellowstone National Park**. The park is an oblong, 65 miles from north to south and 55 miles wide, mostly in the north-west of Wyoming. Within this area are thousands of hot springs and scores of geysers, some of which throw columns of water to a height of 250 feet. Some springs and geysers consist of boiling mud instead of water. Many are heavily impregnated with minerals, and their deposits have formed beautiful petrifactions. The region

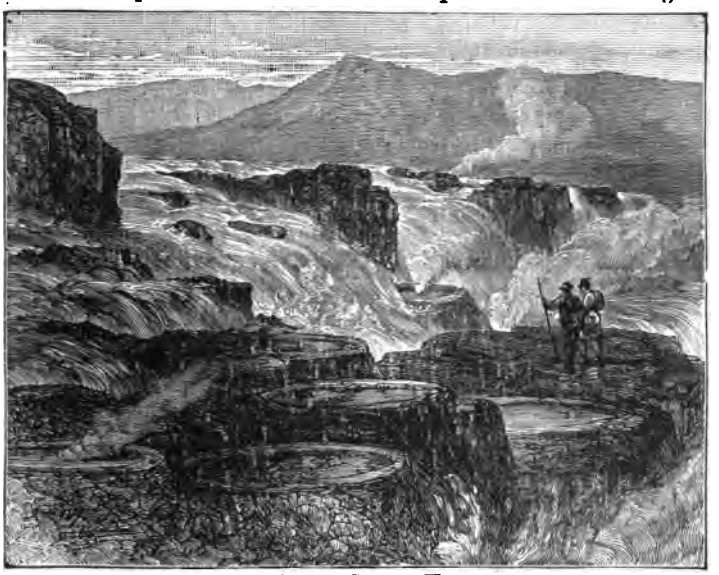


FIG. 22.—BOILING SPRINGS, WYOMING.

contains, in lava beds and dykes, evidences of volcanic action, while the Grand Cañon of the Yellowstone is cut 1000 feet deep through volcanic rock.

East of this plateau the Yellowstone Mountains, with rugged volcanic peaks, and the **Big Horn Range** enclose the Big Horn Basin. To the south-west lies the lofty **Wind River Range**, whose peaks of archaic granite are snow-capped and bordered with glaciers. The beautiful Wind River and Sweetwater Valleys are famous for the many battles here fought between Whites and Indians, since the road by which early settlers made their way westward passed through the latter valley. The **Green River Basin** and **Laramie Plains** extend in southern Wyoming east and west for 250 miles as a high flat plateau,[1] on which are small

[1] 7000 to 8000 feet high.

salt lakes lying on the divide between the Platte and Green Rivers, and across which the first Pacific railroad found an easy way.

Between the parallel ranges of the southern section of the Rockies occur the great Colorado parks, **North**, **Middle**, **South**, and **San Luis Parks**,[1] whose eastern border is formed by the **Front Range** and the **Sangre de Cristo Mountains** with their high granite and basaltic peaks,[2] while on their west are the **Park Range**, the **Sawatch Range**, and the broad, massive, radiating group of the **San Juan Mountains**.[3] These parks form a series of broad basins, in which the head-waters of four large rivers are collected from the forest-covered and well-watered slopes of the bordering mountains. The **Platte** rises in North Park, the **Grand** in Middle Park, of the **Rio Grande del Norte** in San Luis Park, while the **Arkansas** has tributaries from South Park,[4] though rising in the narrow valleys to its west.

The Plateau Belt lies between the system of the Rockies and that containing the Sierra Nevada. At its north, near the Canadian border, the two systems are not far apart, and the space between is nearly filled by a number of lower ranges, while near the Mexican line the Gila depression extends far eastward, and the plateau is lower between this depression and the valley of the Rio Grande than it is either north or south.[5] This plateau belt, thus, in a measure, isolated from the rest of the continent, is a region of much interest, since here are seen the extreme results of the action of some of Nature's forces.

The western mountains shut out the moist winds from the Pacific, and the south-east winds bring but little rain to the Colorado basin, so that the whole region has an exceedingly dry climate.[6] The excessive evaporation causes rivers almost to disappear in the air, and many streams cease to flow after a course of a few miles. Two large streams, the Columbia and the Colorado, which have their sources high up among the well-watered peaks of the Rockies, continue their course to the ocean.

Great beds of salt and white glistening fields of alkali that

[1] San Luis, the largest, contains about 5000 square miles, or four times the area of Rhode Island; North Park, 700 square miles. The Laramie Plains and all the parks are almost too high for tillage, but are good grazing grounds.

[2] Long's, Pike's, Gray's, and Blanca Peaks, with many others.

[3] The San Juan group contains over a hundred peaks between 13,000 and 15,000 feet high.

[4] The South Platte receives most of the drainage from South Park.

[5] This circumstance, so favourable for railroad building, was one reason for the Gadsden Purchase, and the Southern Pacific Railroad now crosses the highland by this route.

[6] See p. 73.

dazzle the eyes of travellers show where ancient lakes existed. Several large areas are real deserts, sandy and bare. Thousands of square miles are covered with lava beds, the product of volcanic activity, yet so old that rivers have cut their channels down through them hundreds of feet deep. Of especial interest are the cañons, the deep and narrow river gorges, here dividing and subdividing a plateau till it remains only a skeleton of its former self, there splitting a mountain-range in two, or cutting deep down through the strata of the earth's crust till the underlying granite is reached and the book of geology opened wide.

Three easily distinguished sections constitute this plateau belt—

1. The northern section belongs to the basin of the Columbia River, and is called the **Columbia Plateau**. The dry and grassy plains of the Columbia or the Spokane Plateau in eastern Washington rest upon a huge bed of lava, the northern edge of which is skirted by the **Columbia** until turning southward and then westward the stream cuts its way through the Cascade Range to the sea. Among the mountains that border and cross the Columbia Plateau in eastern Washington and northern Idaho are many fertile valleys adapted to grazing and wheat-growing. South-east of this are the Snake River Plains in Idaho, desolate fields of lava, around and across which the **Snake or Lewis River**[1] flows in a tumultuous course; its Shoshone Fall, 190 feet high, with its deep dark cañon and towering columns of spray, is a fair rival of Niagara. Other streams from the mountains find channels under the lava beds, and are seen no more. An arid region, nourishing only sage-brush, lies south-west of the **Blue Mountains**, in south-eastern Oregon, and forms a connecting link with the even more arid Great Basin.

2. **The Great Basin**, occupied by Nevada, Utah, and south-west California, lies between the Sierra Nevada and the Wasatch Mountains. Its northern boundary is the low divide that serves to send northward the waters of the Snake River and other tributaries of the Columbia, while on the south the plateaus of the lower Colorado and the coast mountains of southern California are its limit. Numerous narrow steep-sided ranges extend across its surface from north to south, separating flat desert valleys which appear white with alkali or bluish-grey from the prevailing sage-brush. Many valleys contain sinks or swampy basins into which the slender streams from the mountains pour themselves, but which they never fill, so great is the amount evaporated. Even the **Great Salt Lake** was formerly much larger[2] than at present, as is shown by thick layers of alkali and clay in the **Great Salt Lake Desert** adjoining it on the west. It is supplied with fresh water by the

[1] Called also the Shoshone, and formerly the Mad River.

[2] In a former era of the earth's history, this lake covered a large part of the Great Basin and had an outlet through the Snake River. As is shown by ancient shore-lines on the sides of the Wasatch and other ranges, it was then nearly 1000 feet deep. The elevation of the enclosing highlands and the great evaporation have reduced it to its present size.

Bear, the Jordan, and other streams from the neighboring **Wasatch Range**; and as the year is dry or moist, so the lake decreases or increases in size.[1] Other lakes and sinks are found in the western part of the basin. The Humboldt Sink receives the Humboldt River, which, flowing from the **Humboldt Mountains** westward, has cut gorges through several intervening ranges, thus making the way along which the first Pacific railroad was constructed. The valleys of the Humboldt and a few other streams have, through irrigation, become fertile oases, a source of considerable wealth, especially to the **Mormons**, but their area is only a small fraction[2] of the whole section, the prosperity of the population being dependent more on the rich silver mines and other mineral wealth than on agriculture. In the southern part of the Great Basin in California are two depressions, descending below the sea-level. Death Valley, directly east of Mount Whitney, between the Mohave and Ralston Deserts, reaches 225 feet below sea-level, and the Sink of the San Felipe in the Colorado Desert, over 300 feet. Both are extremely hot and dry. The Southern Pacific Railroad goes through the latter.

3. **The Colorado Plateau** region lies to the east and south-east of the Great Basin. The southern water-shed of the **Gila River** forms its southern limit, and the continental divide its eastern. Like the Great Basin, it receives very little rain, the water which the Colorado and its tributaries carry being mainly derived from the surrounding ranges, which are, as a rule, fairly well-watered and wooded, and contain many snow-capped peaks.[3] Hence, in this region, the erosive action of the streams, constantly wearing deeper and deeper into the rock, is the chief force at work.[4] By this action **cañons** have been formed with bottoms lying from a few hundred feet to seven thousand feet, or more than a mile and a quarter, below the level land, so deep and dark in places that a person standing above cannot see the river below. Clouds, he might see, far beneath his feet, even there floating at a height that would enable them to pass without hindrance over the mountains of the east.

Where streams approach one another, the plateaus between dwindle to thin walls, or, severed by cross channels, stand like huge pinnacles or like colossal obelisks carved with creation's hieroglyphics. In the walls of the cañons occur strange forms, the harder rock making broad shelves or standing out in sharp crags or turrets, some grey, some red, or brown, or bluish-black, while great caves and labyrinths of alcoves have been hollowed out in the softer strata. The cañons separate the

[1] In 1872 it measured 2290 square miles; in 1882, 2360 square miles. Its depth averages only about 30 feet.

[2] Not over 3 per cent. of the region can be used for farm crops, water for irrigation not being obtainable.

[3] Small glaciers also exist.

[4] As the cañons are sometimes cut across plateaus that are higher than the land on either side, it must be supposed that the plateaus were gradually elevated while the streams were flowing across them, but so slowly that the cutting action of the water was able to maintain the channel in the same position. But in some places it seems probable that the original bed of a stream was even at a higher level than that of the highest land remaining, as where the Green River has cut across the Uintah Mountains.

neighboring plateaus so completely that the country is practically impassable. Two railways, however, have been constructed. The Denver and Rio Grande, from Denver, Colorado, to Ogden, Utah, passes along the Grand River by means of some of the most remarkable feats of modern engineering, and discloses scenery unequalled in grandeur. Farther south the Atlantic and Pacific road crosses the Little Colorado and also the Colorado itself.

Upon the southern plateaus are many mountains, chiefly in three groups, of which the **Zuni** in New Mexico and the **Mogollon** and **Pinal** in Arizona are representatives. The **San Francisco Peaks** on the Colorado Plateau are **extinct volcanoes**, and in many places are basaltic peaks, beds of lava, cinder cones, and ashes. To the lava-beds are due in large part the **mesas**, flat-topped mountains or plateaus, which border the Grand River, and are especially numerous in New Mexico. The hard layer of lava has preserved the softer rock below, while the level of the surrounding country was lowered hundreds, and in some cases thousands of feet.

On these **mesas** the ancient inhabitants of this region, probably the ancestors of the present Pueblos and Moquis, built their villages or **pueblos** after the invading Apaches, Utes, and other "Red-Skins" had driven them from the more fertile bottoms. And in the caves in their sides and in cañons, as a last resort, cave-dwellings were built, to which ladders and steps cut in the rock were the only means of approach.

The basin of the Colorado begins in Wyoming with the arid valley [1] of the Green River, north of the **Uintah Mountains**. In this range begin the cañons, their names [2] evidencing their nature. South of that range is a series of plateaus from twenty to sixty miles wide, each rising gently to the south and then abruptly descending as cliffs from 1200 to 2000 feet [3] high. Straight across these plateaus extend cañons,[4] in one of which the **Grand River** joins the **Green**, and the real Colorado begins 1300 feet below the surface. Its course for 500 miles onward is cut through plateaus varying from 5000 to 8000 feet in elevation. Its cañons grow deeper, and numerous side cañons of tributary streams increase the wildness of the region. At the mouth of the Little Colorado is **Marble Cañon**, cut 3800 feet deep, and farther west is the **Grand Cañon**, its great gorge descending first by wide terraces, then steep slopes, and finally by cliffs to the granite bottom 7000 feet below. From here on, the surface descends across lower plateaus, where occurs the wonderful **Black Cañon**, to the lands of the **Mohave** and **Gila Deserts**.

The Pacific Ranges.—As in the Rocky Mountain System,

[1] This valley, really the western extension of the Laramie Plains, bears also the name of the "Great American Desert."

[2] Flaming Gorge, Cañon of Lodore, Red Cañon, Whirlpool Cañon, Split Mountain Cañon.

[3] Called Bad Land Cliffs, Brown Cliffs, Roan Cliffs, and Orange Cliffs.

[4] Desolation Cañon, Labyrinth Cañon, Stillwater Cañon. Farther down the river occur Cataract Cañon, Marble Cañon, Grand Cañon of the Colorado, Black Cañon, Painted Cañon, Pyramid Cañon, Mohave Cañon, Canebrake Cañon, besides innumerable side cañons.

the ranges on the west of the Plateau Belt have a parallel arrangement with broad valleys between.

The broad lava-covered **Cascade Range** with its many volcanic peaks,[1] and the northern part of that complexity of low ranges collectively known as the **Coast Range**, form the east and west walls of the fertile and well-watered valley of the Willamette in Oregon, and of Puget Sound in Washington, for which the Strait of Fuca and the Columbia

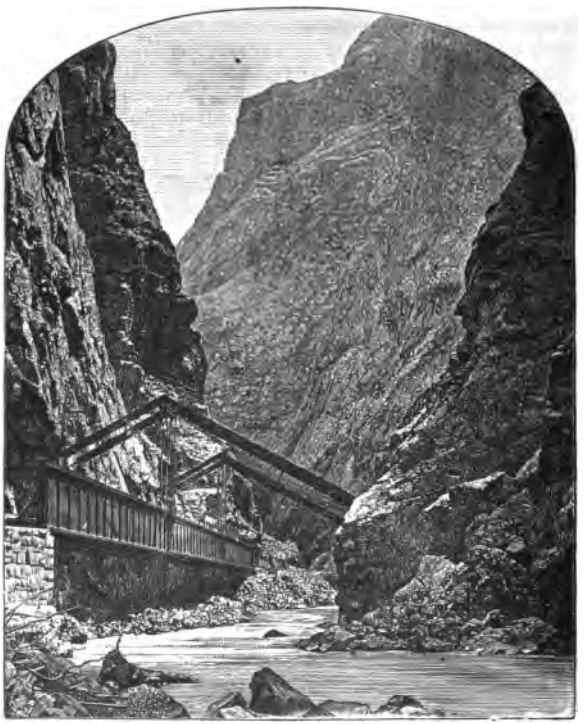


FIG. 23.—THE ROYAL GORGE—THE DENVER AND RIO GRANDE R.R.

River furnish outlets to the ocean. To the south are cross ranges forming also the northern boundary of the great **Valley of California**, whose eastern wall, the lofty Sierra Nevada, descends by a long gentle

[1] Mount St. Helen's was active in 1843; Mount Baker, Mount Rainier or Tacoma, and Mount Shasta still give evidence by hot springs or otherwise of the presence of internal heat.

slope[1] to the level land about the Sacramento and San Joaquin Rivers. At its northern end, between the volcanic peaks of **Mount Lasson** and **Mount Shasta**, the Sierra is low and covered with lava, here allowing waters from the interior plateaus to escape through the Klamath and Pitt Rivers. Farther south it contains many lofty peaks, **Mount Whitney**, nearly 15,000 feet high, being the loftiest in the United States.[2] At its middle point lies the famous **Yosemite Valley**, remarkable for its steep towering walls and the strange forms of rocks that they contain, as well as for the great height and beauty of its waterfalls.[3] The Coast Range on the west has many small valleys opening to the ocean, and is divided in two by the depression of the San Francisco Bay. At Tejon Pass[4] it unites with the Sierra Nevada, and thence southward into Mexico they continue together a confused mass of low ranges, distinguishable from one another only by the different rocks of which they are composed.

FIG. 24.—ANCIENT CLIFF DWELLINGS IN THE MESA REGION.

[1] Average breadth of this range is about 80 miles. The eastern slope facing the Great Basin is steep, like the slopes of the Basin Ranges, and presented many engineering problems to the builders of the Central Pacific Railroad. At the great "loop" the road after a long circuit passes over itself to gain a higher elevation.

[2] Except peaks in Alaska.

[3] The base of the valley is a level area about six miles long and about half a mile wide, but nearly a mile below the level of the land around. The falls 400 feet, 600 feet, 700 feet, or even 1500 feet high.

[4] At 35° N. latitude in southern California.

The Great Plains have at the eastern base of the Rocky Mountains an elevation ranging from 4000 feet in Montana to 7500 feet in Colorado and 5000 feet in New Mexico. From these heights they descend to the east in a long gentle slope, being at places apparently quite horizontal, and reach the line of 2000 feet elevation at about the 100th meridian. The surface is what is called rolling, the rivers have wide valleys, and the divides between them are low.

In the north the monotonous aspect of the plains is broken in Montana and South Dakota by detached ranges of mountains, **Little Rocky Mountains, Powder River Range,** and **Black Hills**; and **Bad Lands** occur in these states and in Wyoming, where the action of water and wind has disintegrated the soft clay-rock and left strange-looking pillars and cliffs standing in a sterile waste.[1] In the north-west of Nebraska is an extensive area of sandhills. In the south, in New Mexico and Texas, is the **Llano Estacado** or **Staked Plain**,[2] which is a level waterless region, more plateau-like than the land to the north, since its slopes are more abrupt. From its north-east a line of low hills extends across Texas and Indian Territory, rising in Arkansas and Missouri into the Ozark Mountains. From these hills the rivers of Texas take a course more southerly than easterly, and, excepting the tributaries of the Red River, they flow to the Gulf of Mexico instead of to the Mississippi.

II. The Eastern Lowland.—Eastward from the Great Plains the long slope of the Rockies is continued into the **lowland half** of the United States. The part of this slope that lies south of the Red River[3] terminates at the Gulf of Mexico.

The central and largest part from the Red River to the Height of Land in northern Minnesota descends gradually to the Mississippi, and constitutes the western portion of the **Mississippi Basin**. Thence eastward the surface rises slowly to the **Appalachian Highland**, which forms the eastern rim of the basin, and from this elevation descends gently to the Atlantic, here constituting the **Atlantic Slope**, and occupied by what are called the Atlantic States.[4] In the south the Atlantic Slope and Mississippi Basin are not separated by the Appalachians, but

[1] In eastern and southern Montana, the western part of North and of South Dakota, and in north-eastern Wyoming.

[2] Its name is said to be derived from the stakes set up upon it to indicate to travellers the localities where springs exist. Another derivation is from the stake-like appearance of the yucca plant, the most prominent vegetation.

[3] Of Louisiana and Texas.

[4] See profile, D. p. 63.

rather are joined together by the land sloping southward from those mountains to the Gulf of Mexico.

North and north-east of the Basin of the Mississippi the long slope of the Rockies continues eastward to the Gulf of St. Lawrence, and here contains a broad depression, deepest on the south, and there occupied by the Great Lakes and the St. Lawrence River. This **Basin of the St. Lawrence** includes in the east the northern slope of the Appalachian highland, which separates it from the Atlantic Slope in Maine, New Hampshire, Vermont, and New York. Farther west it is separated from the Mississippi Basin by low divides, scarcely distinguishable above the surrounding surface, and usually quite near the shores of the lakes. Its northern boundary is the **Height of Land**, in northern Minnesota, and the low range of the Wotchish Hills in Canada.

North of the Height of Land is a small area with a northward slope, a part of the great northern plain that is occupied almost wholly by Canada. The Red River of the North, which flows to Lake Winnipeg, has its rise in a small lake, whose waters are sometimes joined by floods to the head-waters of the Minnesota River, thus uniting indirectly the Gulf of Mexico and Hudson Bay. The Red River Valley is evidently the filled-up basin of an ancient lake, and is so level that it shows the curvature of the earth, the tops of distant trees being first perceived, like the upper sails of vessels at sea.

The Appalachian System, which forms the highest part of the lowland half of the United States, has, like the system of the Rockies, an arrangement of parallel chains and groups enclosing a central valley. This valley, called the **Great Appalachian Valley** and also the Great Valley of the Alleghanies, is less sharply subdivided than the series of parks and basins in the west, having a recognised continuity throughout the system from the Gulf of St. Lawrence to Alabama.

It bears, however, different names in different sections, as do the mountains on its border. In Canada it is the valley of the lower St. Lawrence. Next it is occupied by Lake Champlain and the middle course of the Hudson as far as Kingston, and then trending to the south-west, it becomes in Pennsylvania the Lebanon Valley and the Cumberland Valley, both rich and fertile.

Still farther south it is the Great Valley of Virginia with the famous and beautiful Shenandoah Valley, and in its southernmost section it expands into the broad and flat Valley of East Tennessee.

In its northern and southern parts this long depression is of great service as a route for commerce, much of the traffic between New York and Montreal and Quebec passing through it, and also much of that between Norfolk and Memphis or New Orleans.

Besides this division into an eastern and a western half, two sets of cross valleys, the Mohawk-Hudson depression and that of the James and Kanawha Rivers, divide the Appalachian System into a northern, a central, and a southern section. Each of these sections has a curved outline bending away from the coast, and they run roughly parallel to the three great curves that characterise the coast between Nova Scotia and Florida.

1. **The northern section** extends from the Mohawk-Hudson depression to the Gulf of St. Lawrence.

In the United States it contains the **Adirondacks** in New York (**Mount Marcy**, 5400 feet), a group of granite ranges of the oldest geological formation of the continent; the **Green Mountains** in Vermont (**Mount Mansfield**, 4430 feet), next in age to the former, called in Massachusetts Taconic and Hoosac Mountains; and the **White Mountains** in New Hampshire (**Mount Washington**, 6288 feet), the Switzerland of America. North-east of the White Mountains are numerous peaks of moderate elevation (**Katahdin**, 5200 feet), forming part of the low lake-dotted plateau that occupies the north of Maine. These groups of the northern division are well-wooded with pine, spruce, and hemlock, and the many short and rapid rivers that descend from them to the St. Lawrence or to the Atlantic carry logs[1] and furnish power to numerous lumber-mills as well as to various factories, and early made manufacturing a leading industry in these states. Between the Green Mountains and the Adirondacks is that part of the Great Appalachian Valley occupied by the picturesque **Lake Champlain**, to which come numerous small streams from the neighboring mountains. To its south and east lies **Lake George**, one of the most beautiful of the lakes of New York.

2. **The middle section** of the Appalachians, beginning with the picturesque group of the Catskills, reaches with a strong westward curve from the Mohawk and Hudson to the New River in southern Virginia.

In Pennsylvania, Maryland, and Virginia it consists of low ridges and ranges enclosing numerous small valleys, which are very fertile if

[1] Compare p. 235, on the rivers of Switzerland.

in a limestone formation, but much less so if the soil be slaty. The strata here have been much folded and broken, and great denudation has taken place, so that this middle section is the lowest part of the system. Railroads cross it from east to west, and three large rivers, the **Delaware**, **Susquehanna**, and **Potomac**, make their way in zigzag courses from valley to valley, through breaks in the ranges, of which the **Delaware Water Gap** and the pass by which the Potomac crosses the Blue Ridge are famous for their beauty. The folding and tipping of the strata, which are partly of the Carboniferous Period, served to expose the many coal-seams, and, when the heat that resulted from the pressure had driven off the more volatile elements, the harder anthracite coal was formed. In other sections, where the coal-beds have been less folded, the coal remains bituminous.

It is noteworthy that the central section, the lowest part of the system, has been the scene of the greatest amount of canal building that has been done in the United States. The Erie Canal, connecting Lake Erie and the Hudson, follows the valley of the Mohawk for a long distance. After its completion in 1825 New York City, which had previously been smaller than Philadelphia, rose to the position which it has since held of the first commercial city of the Union. Branch canals connect the Erie with Lake Ontario [1] and with the Black.[2] Others not now navigated led to the Alleghany [3] and Susquehanna [4] Rivers.

The Hudson is similarly united to Lake Champlain [5] and to the Delaware River,[6] the Delaware to the Susquehanna,[7] while other canals parallel these streams and their branches. Two canals to connect the Potomac [8] and James Rivers [9] with the Ohio were planned and partly constructed, when the development of railways prevented their completion.

3. In the **southern section** the ranges are at their highest (**Black Dome**,[10] 6707 feet), and the system is complicated by a number of cross ranges that extend from the Blue Ridge in North Carolina to the mountains to the west, dividing the high valley between into small enclosed basins, from which tributaries to the Tennessee flow westward into the Great Valley.

[1] Oswego Canal.
[2] Black River Canal.
[3] Genesee Valley Canal.
[4] Chemung and Chenango Canals.
[5] Champlain Canal.
[6] Delaware and Hudson, Morris and Essex Canals.
[7] Union Canal.
[8] Chesapeake and Ohio Canal.
[9] James River and Kanawha Canal.
[10] Called also Clingman's Mountain.

Grassy tracts, here called **savannahs**, occur between belts of timber that grow on the hills or in favoured portions of the plain. From the Missouri to the Red River this section forms a part of the basin of the Mississippi, while from the Red to the Rio Grande it constitutes the **western portion of the Gulf Slope.**

From the mouth of the Ohio to the Gulf of Mexico on both sides of the Mississippi extends a strip of alluvial land, 40 to 100 miles wide and 500 miles long, the surface of which is at a lower level than that of the river itself. Only the higher banks of the streams and the levees constructed upon them prevent this overflow basin or **bottom land** from being constantly under water, while the larger part of it is occupied by cypress swamps, bayous, small crescent-shaped lakes, and standing water left from the ever-recurring floods. Only the small portions that are above the reach of the floods can be cultivated, but these produce abundant crops of corn, cotton, sugar-cane, rice, and oranges. East and west the bottoms are bordered by the **bluffs**, upon which, at places where the river flows at their base, the large towns **Baton Rouge, Natchez, Vicksburg,** and **Memphis** are located. **Bayous** which flow out from the river take their course first away from it to the bluffs, along which they flow, until, at a place where the bluffs and the river approach, a re-entrance into the larger stream is effected. Below the mouth of the Red River several similar streams or bayous flow from the Mississippi to the Gulf (Atchafalaya, Iberville). Besides occupying this large area along the Mississippi, this bottom land extends also along the Arkansas River nearly to Little Rock, and along the Red River to and beyond Shreveport, and constitutes also the **delta** of the Mississippi.[1]

The eastern portion of the **Gulf Slope** and much of the **Atlantic Slope** have along the coast a broad belt of swampy land much like the delta and the bottom lands in formation.

The **Okefinokee Swamp** in Georgia, **Alligator Swamp** between Pamlico and Albemarle Sounds, and the **Great Dismal Swamp** in North Carolina and Virginia are extended portions of this unhealthy belt, the southern portion of which is formed by the **Everglades**, in the Florida peninsula. Cypress and live-oak trees abound in it, and even mangroves[2] grow on the coast of Louisiana, while, especially in South Carolina, Georgia, and Louisiana, large tracts are utilised as **rice-fields.**

Inland from the swamp belt is a **sandy plain** of very slight elevation, that extends from the Mississippi Bottoms eastward into Georgia, and then north-east to New York. It is widest in the south, where it occupies nearly the whole of Mississippi,[3] and western Tennessee, and Kentucky, here meeting the prairies of Illinois. The southern third of Alabama, northern Florida,

[1] Consult a geological map to see the extent of this formation. [2] See p. 58.

[3] Only the bottom lands and the north-east corner of Mississippi are outside of the plain.

and the half of Georgia belong to it. Thence northward, gradually diminishing in breadth, it constitutes the eastern part of South and North Carolina, of Virginia, of Maryland, the whole of Delaware, and all but the northern highland part of New Jersey. Its further continuation may be recognised in the low southern half of Long Island and in the sandy Cape Cod peninsula. The soil of this plain is in the south not very rich, except along the streams, but it supports extensive pine forests, which remain a steady source of supply of lumber and naval stores.[1]

A series of extensive beds of a kind of rich earth called marl extends from Mississippi to New Jersey through this sandy region, and furnishes a needed and much-used fertiliser. In South and North Carolina rocks containing much phosphate of lime are quarried in great quantities and made into a fertiliser, which, besides being widely used in America, is exported to England and Germany.

Lying between this sandy plain and the Appalachians is a more elevated area, which rises gradually to the mountains, and, like them, is highest in the south. To the north-east it continues farther than the sandy coast plain, forming in the New England States the whole of the slope from the mountain to the sea. Its underlying rock is mostly granitic, and contains a great variety of mineral wealth, while its eastern edge forms throughout a most important economic feature; it causes falls or rapids in the rivers that flow across it, thus determining the location of many towns.

Of such may be mentioned **Montgomery**, Ala.; **Milledgeville** and **Augusta**, Ga.; **Columbia**, S.C.; **Raleigh**, N.C.; **Petersburg** and **Richmond**, Va.; **Washington**,[2] D.C.; **Baltimore**, Md.; **Wilmington**, Del.; **Philadelphia**, Penn.; and **Trenton**, N.J.

From the sea up to this granite escarpment the rivers are navigable, being usually tidal streams,[3] thus adding another circumstance favorable to the growth of these towns. In the New England States this edge forms the rocky coast there prevalent, and having been subject to glacial action, is worn into numerous fiord-like bays, which are prolonged inland by the river valleys.

[1] Lumber from the long-leaved yellow pine, and tar, pitch, rosin, and turpentine from the short-leaved pitch pine.

[2] More exactly its suburb Georgetown, the eastern terminus of the Chesapeake and Ohio Canal.

[3] Hence the term *tide-water* plain, applied to the sandy belt.

Hence **Hartford**, Conn., **Providence**, R.I., **Augusta** and **Bangor**, Me., the heads of navigation, are at a distance from the sea.

In the southern states this elevated area is the more healthful section, and its surface combines gently sloping hills and valleys with considerable stretches of more level land. Its soil is throughout fertile and easily cultivated. In the New England States, however, it is somewhat stony.[1]

Rivers.—The rivers of the United States, according to their location and discharge, are grouped into various systems. Those that flow into the Atlantic constitute (1.) the **Atlantic System**; those east of the Mississippi flowing into the Gulf, (2.) the **Alabama System**; those to its west, (3.) the **Texas System**; the St. Lawrence and its tributaries, (4.) the **St. Lawrence System**; the Mississippi and its tributaries, (5.) the **Mississippi System**; the Red River of the North and others belong to (6.) the **Hudson Bay System.** West of the Rocky Mountains are (7.) the **System of the Columbia**; (8.) the **continental rivers** of the Great Basin; (9.) the **System of the Pacific Coast**, including the rivers of California and those west of the Cascade Range; and (10.) **the Colorado System.**

The rivers of the Atlantic, the Alabama and Texas Systems, are not of great length, but as they nearly all furnish **water-power** in their upper courses and are available for **navigation** in their lower courses, they are of much local importance, many furnishing harbors to ocean-shipping at their mouths.

The **Hudson**, occupying the deep and picturesque valley between the northern and central sections of the Appalachians, is the most important, since, with the Erie Canal and the Great Lakes, it forms the great water route between the east and the west, and is for the United States what the St. Lawrence is for Canada. The ocean tides affect it to Troy, to which city the largest river steamers ascend, while between Albany and New York great tows of canal-boats and barges find easy passage. Its valley offers also an easy route for railroads, which turn westward through the gateway of the Mohawk Valley and find an almost level way to the lakes and the prairies beyond. Only south of the Appalachians, along the southern plain, is there another such level connection between the Atlantic seaboard and the Mississippi Valley. In connection with Lake Champlain the Hudson is the natural route between

[1] The New England States and New York, Michigan, Minnesota, and the northern parts of Pennsylvania, Ohio, Indiana, and Wisconsin contain much stony soil and many boulders, since they lie in the area which was in a previous geologic age covered by extensive glaciers.

New York City and Canada, and its strategetical importance made it the scene of many conflicts in the early history of the country.

The **Delaware** and **Susquehanna** have shorter navigable courses than the rivers farther south, since the mountains here are not far from the heads of the Chesapeake and Delaware Bays, into which they flow.

The **Potomac**, **James**, **Savannah**, and **Alabama** are the most important of the southern streams.

In the **Texas System** the **Trinity** in the flat eastern plain and the **Rio Grande** are navigable for 300 to 400 miles, the city of Galveston on the bay at the mouth of the Trinity being the chief commercial town of the state. The **Brazos** and **Colorado** offer only coast lagoons to the navigator. Many of the Texas rivers are subject to sudden floods, contain much reddish clay as sediment, and receive, like the rivers of the Great Plain, salty tributaries in their upper courses.[1]

The **St. Lawrence System** drains but a small part[2] of the United States, yet it derives high importance from its great volume of water, its superior navigability, from its extending far into the centre[3] of the continent in a direction from east to west, and its situation in the midst of the mineral and agricultural wealth of the land.

The five Great Lakes, **Superior**, **Michigan**, **Huron**, **Erie**, and **Ontario**, constitute the largest collection of fresh water on the earth, the five greatest lakes of Africa being nearly equal in area, but not belonging to one system. Lake Superior, the largest and highest,[4] has an area of 32,000 square miles, or about the same as Maine, and Lake Ontario, the lowest[5] and smallest, 7500 square miles, or six times the area of Rhode Island. Three canals, the St. Mary's Canal around the rapids between Lakes Superior and Huron, the canal in Lake St. Clair to deepen the channel, and the Welland Canal, made on account of Niagara Falls, have made the lakes navigable throughout, and with the canals along the rapids in the St. Lawrence enable vessels large enough to cross the Atlantic to pass into the continent nearly as far as from Gibraltar to Constantinople.

The total length of navigable waters of the system is about 4000 miles. The greater part of the commerce, however, is upon

[1] The total drainage area of the Atlantic System is 300,000 square miles; of the Alabama, 145,000; of the Texas, including the Rio Grande, 280,000.

[2] 82,000 square miles, or less than is drained by the rivers that flow to Lake Winnipeg, 102,000 square miles.

[3] The centre of North America lies within the boundaries of Minnesota.

[4] The surface of the lake is 602 feet above the ocean's level.

[5] 247 feet above sea-level.

the four largest lakes, and centers in Buffalo, at the eastern end of Lake Erie, from which point it takes the shorter route to the seaboard *vid* the Erie Canal and the railroads to New York, in preference to the passage *vid* the St. Lawrence. In winter the border of ice that forms along the shores of the lakes prevents navigation, the "season" closing usually about the end of November and opening about the first of May.

The shores of Lake Superior are usually high and steep, especially on the north, and contain many points of great natural beauty, while the low mountains on its south contain valuable deposits of copper[1] and iron. The other lakes have low shores, often sandy with high dunes, as on the east of Lake Michigan.

The **Niagara River**, with its great cataract and deep gorge, is counted as one of the wonders of America. The great roar of the torrent, which falls at once about 150 feet,[2] may be heard several miles distant, and the spectacle presented is, especially in winter, one of great beauty and sublimity. As the rock at the brink of the falls is slowly wearing away, thus lengthening the gorge that leads northward to Lake Ontario, the length of the gorge gives a measure of the time that has elapsed since their beginning, for in a previous age Lake Huron had a direct connection with Lake Ontario.[3]

The **Thousand Islands**[4] in the St. Lawrence, where it passes over a wide neck of granitic rock, and the numerous **rapids** in the stream below are noteworthy among the attractions of the river.

The influence of the Great Lakes on the climate of the neighboring land is to temper the heat of summer and the cold of the early winter, thus making southern Michigan, southern Ontario in Canada, northern Ohio, and western New York favored sections for fruit-growing, the celebrated Catawba grape maturing on the south of Lake Erie. A deep snowfall—the deepest in the United States—occurs, and a late spring is caused by the influence of the ice in the lakes.

The **Mississippi System**, occupying the great valley between the Appalachians and the Rockies on the east and west, with the Height of Land at the north, comprises three chief streams coming from these three border elevations, the **Missouri**, the

[1] Copper-mines were found here that had been worked by Indians, probably of the mound-building races.

[2] The American Fall is 164 feet high, the Canadian 150.

[3] The two lakes then formed part of an arm of the sea, of which the Mohawk and Hudson depression was the eastern continuation.

[4] Another group of the same name lies off the south-west coast of Florida.

upper Mississippi, and the **Ohio**. The longest, the **Missouri**, about 3000 miles from source to mouth, unites in its upper course the waters of many streams (the Jefferson, Gallatin and Madison Forks, and the Yellowstone), coming from the Yellowstone Park and the near-lying ranges; but in its long passage across dry plains loses so much by evaporation and absorption[1] that it has less volume at its mouth than the much shorter Ohio. Its navigation, which extends in times of high water even to Fort Benton in Montana, is rendered difficult by sandbanks and a changing muddy current.

Of similar character are the Platte and Kansas and other rivers of the plains, whose chief value is for irrigation. The Arkansas and the Red, which join the Mississippi below the Missouri, also suffer from evaporation as they cross the plains, but are navigable in their lower courses, and together equal the Missouri in volume.

From the north comes the **Mississippi**, rising in Lake Itasca, one of the smaller of the 5000 lakes of Minnesota, having the Minnesota, Iowa, Wisconsin, and Illinois as tributaries. Its upper course contains many rapids and falls, of which the St. Anthony Falls at Minneapolis, Minnesota, have enabled that city to become the chief flour-making center of the country. Below these falls at St. Paul the continuous navigation of the river begins. The area drained by the upper Mississippi[2] is but one-third that of the Missouri,[3] but its rainfall is nearly double,[4] making the volume of the stream nearly as great. The **Ohio** bears its name only from the confluence of the **Alleghany** and **Monongahela**, or from the head of ordinary navigation to its mouth. Its total length is about 1300 miles, or a little less than that of the upper Mississippi, but its basin[5] is larger, its rainfall[6] greater, and it carries much more water, receiving large navigable tributaries, the Cumberland and Tennessee from the south, and the Wabash from Indiana, besides many lesser streams.

[1] In its mountain source and long course across dry plains the Missouri bears a resemblance to the Nile, as does also the Colorado.

[2] Area of Basin of upper Mississippi, 179,000 square miles.

[3] Area of Missouri Basin, 627,000 square miles.

[4] Rainfall of Missouri Basin, 18 inches per year; rainfall of upper Mississippi Basin, 34 inches per year.

[5] Area of Ohio Basin, 207,000 square miles.

[6] Rainfall of Ohio Basin, 43 inches per year.

Fig. 25.—The Mississippi, at St Louis.

A reef of coral limestone at Louisville necessitated a canal for ascending vessels, but the rapids, like those of the St. Lawrence, may be descended with safety. The Ohio and Mississippi are distinguished from the Missouri by the clearness of their water. All three streams are very wide, 3000 to 5000 feet at their mouths.

The lower Mississippi has a length of some 1300 miles, about one-half caused by its windings through the bottom lands. Navigation is practicable throughout the year unless low water occurs, not being interrupted by ice, as on the three great head-streams. Only once in four or five years does the Mississippi freeze across at St. Louis.

The **floods**, which occur yearly, are highest in late March, with a second rise in June, at which time the water reaches a height of 50 feet above its lowest stage, which occurs in October. This height is also reached by the Ohio, while the Missouri and upper Mississippi rise about 35 feet. The danger from floods is less below the mouth of the Red River, as the numerous side channels relieve the main stream, and high-water at Baton Rouge or New Orleans is much less than at Natchez, although the chan-

FIG. 26.—SCENE IN THE COLORADO BASIN.

nel is narrower, while at the passes in the delta the rise is less than three feet. Beyond the delta the presence of river-water is easily noticed by the dark muddy color which extends ten to fifteen miles into the Gulf. It is estimated that the amount of sediment yearly discharged by the river would cover a square mile 300 feet deep.

The basin of the lower Mississippi constitutes with the Alabama basin the best-watered area[1] of the United States, and, aided by an almost tropical climate, is a region of great productivity.[2]

The system of the **Columbia** drains an area within the United States about equal to the basin of the Ohio, but with less than half as much rainfall,[3] since it lies almost entirely east of the Cascade Mountains.[4]

From the great extent of mountainous land that borders its basin, the Columbia receives many tributaries, abounding in falls and rapids and surrounded with picturesque scenery. Gold is found in many of the streams, and the salmon-fisheries are world-renowned.

The falls of the **Spokane** promise to create a second Minneapolis, and numerous flouring and saw mills make use of the abundant water-power at other places. Navigation is far from continuous, the **Cascades** and the **Dalles** offering serious obstruction, and in the long section from the mouth of the Snake across the lava-beds to the Canadian border occur numerous rapids. Improvements, however, are being made, and the upper reaches of the main stream and its leading tributaries are already navigable by light-draught steamers. At the same time canals are being constructed around the lower falls, and jetties at the entrance of the river into the Pacific.

The **rivers of the Great Basin**, with their salt lakes and swamps, are like those of other such enclosed arid areas,[5] as the Bolivian Basin in South America or that of Eastern Turkestan in Asia. Their chief use is in irrigation.[6]

The **Colorado**[7] **Basin** has only a small supply of rain,[8] mostly in the mountains. The river is too far below the surface to be of use in irrigation, except in very small areas of bottom land. Its occasional floods sometimes make a lake in the depression of the Colorado Desert, but this eventually disappears through evaporation. The lower 500 miles

[1] The lower Mississippi Basin of 65,000 square miles, not including the areas drained by the Red and Arkansas, receives 50 inches; the Alabama Basin, 52 inches of rain per year.

[2] On the Red River of the North, see p. 107.

[3] Columbia Basin, 18 inches per year; Ohio, 43 inches.

[4] See pp. 72 and 101.

[5] The rainfall of the Great Basin is but 12 inches per year. The mountains receive the most, some sections almost none.

[6] See paragraph on Great Basin, p. 101.

[7] See p. 102.

[8] Fifteen inches per year. The southern part by Fort Yuma has but three inches.

of the river are navigable, and copper ore from mines in Arizona finds shipment in this way.

Of the many short rivers that flow to **Puget Sound**[1] and to the **Pacific**, the Sacramento and those northward, lying in a region of abundant rain, are of much value for their water-power, especially to the lumbering interests. The San Joaquin and those southward are in a region of slight precipitation, and are used mostly for irrigating.

Climate and Agriculture.—The situation of the United States in North America is so central and its extent so great, that to speak of its **climate** would be but to repeat much that has already been said on the climate of the continent.[2] It will suffice to observe how the climate determines the productions in the industries that most closely depend upon it.

As determined by the amount of rainfall, the chief **agricultural region** lies in the eastern lowland section[3] and occupies about one-half the total area of the country, extending from the Gulf of Mexico to the Canadian border and from the Atlantic westward to about the 100th meridian. Along some river valleys it reaches beyond this western limit, and in some places not so far.

A second area of about one-twentieth the size of the eastern occupies the lowland valleys of Washington, Oregon, and California to the west of the Cascade and Sierra Nevada Mountains.

On the dry plateau lands between the Pacific ranges and the 100th meridian but small portions of the surface are cultivated, in all perhaps one per cent. of the whole, and mostly through irrigation.[4]

In the eastern agricultural area differences in temperature and in rainfall cause a difference in the crops, which vary chiefly according to the amount of heat and moisture required for successful cultivation.

Three principal agricultural belts are easily distinguished—1. A southern belt, whose chief crop is cotton, a plant of tropical origin and requiring much warmth and moisture. This **cotton belt** includes nearly all the land from the Gulf coast to the mouth

[1] Puget Sound area has 42 inches rainfall per year, the California Valley, 21 inches; but Monterey and Santa Barbara sections only 13 and 12 inches.

[2] See pp. 71–77.

[3] See pp. 97, 106.

[4] It is estimated that a larger area, possibly 150,000 square miles, or about 12 per cent. of the arid area, may be reclaimed by extensive irrigation works, and a Commission has been appointed by the Government to examine the matter and report on its feasibility.

of the Ohio, as well as the Atlantic slope north-east to the James River in Virginia. 2. A middle belt, raising chiefly corn, likewise a tropical plant, but having a wider range than cotton. The **corn belt** includes most of the Prairie States, and reaches eastward to the Chesapeake, and thence north-east into New Hampshire.[1] 3. A northern belt, in which **wheat** and **oats** predominate, the former in the drier western section, the latter in the more moist east. In the northern belt are grown also the larger part of the barley, rye, and buckwheat of the country, and it represents well the agriculture of Canada, whose farming area is directly adjoining and has a similar climate and soil.

In the agricultural area of the Pacific States the moist climate suitable for oats is found along the coast north from San Francisco, especially in western Washington, while wheat and barley are the chief crops in the drier parts. The farmers here sow their grain mostly in January and February, so that it shall have the advantage of the winter rains; but in the east, where the winter is more severe, the sowing and planting are done in the spring, except in the southern part of the wheat belt, where "winter wheat" is sown in the autumn.

Products of Agriculture and Grazing.—The **leading crop** of the United States is **corn**, the yearly value of which is greater than that of all other grains together, or double that of the wheat or cotton. The greater part of the corn is consumed in the country, the finer varieties being used for food, and the common corn in fattening animals, for which purpose its large percentage of oil makes it valuable. Corn-stalks are much used for fodder, while in some of the western prairie states the ears are used now and then as fuel, a hundred bushels being equal in heating power to a cord of hard wood. The leading corn-growing states, **Illinois, Kansas, Iowa, Missouri, Nebraska,** and **Indiana,**[2] are also foremost in the numbers of **cattle, swine,** and **sheep** that they raise. **Chicago, Kansas City, St. Louis, Indianapolis, Milwaukee,** and other towns do a large business in such **provisions**

[1] In the north-east extension of the cotton belt and of the corn belt along the coast is seen the effect of the longer duration of warm weather that these regions enjoy, by reason of their favorable situation between the mountains on the one side and that portion of the Atlantic most warmed by the Gulf Stream on the other.

[2] Although produced most advantageously in the sections mentioned, the various grains are not confined to them, wheat and oats being produced in every state and territory, corn in all but one, barley and rye in all but two, and buckwheat in all but the warmest areas.

as beef and pork, and these two articles form a large part of the exports of the country. Large numbers of cattle and sheep are raised also wherever extensive grass-lands are found, ranches being numerous in Texas, California, and the states of the plains. The two states just mentioned and Ohio lead all others in the production of **wool**. The manufacture of woollen goods, however, is most largely carried on in the New England States, New York, and Pennsylvania.

Hay is the second crop in value,[1] being cut[2] most largely in **New York**, **Iowa**, and other states in the two northern agricultural belts, which contain also the states that produce the most **milk**, **butter**, and **cheese**.

Oats, although the first crop in **Maine**, **Vermont**, and **New York**, are more largely harvested in **Indiana**, **Illinois**, and other prairie states. These states, first in the production of oats, contain also the largest number of **horses**, but mules are used more in the states of the cotton belt. **Potatoes** are extensively raised in the oat-producing states.

Wheat is not only the leading crop in the **northern belt** and in **California**, but is the second in amount in the corn belt. For many years this grain and the flour made from it have been among the first of American exports, for although the number of bushels raised to the acre is relatively small, the great acreage gives a larger aggregate crop than can be consumed at home—a larger crop than that of any other country.

Much of the superiority of the United States in the production of wheat is due to the extensive use of highly developed machinery used in ploughing, sowing, reaping, and threshing, and to the large areas, giant farms, devoted to wheat alone. In the western European markets wheat from America has to compete with that from Russia, Austria-Hungary and other Danubian states, India and Australia.

Great waterfalls, as those of the Mississippi at **Minneapolis**, or those of the Genesee at **Rochester**, have made such cities centers for **flour-making**, the products of flour and grist mills being the most valuable of the manufactured products of the country. Chicago, Duluth, and St.

[1] Corn, hay, wheat, cotton, oats, potatoes, tobacco, barley, rye are the leading agricultural products in order of value in 1886.

[2] Hay is cut in all the states and territories.

Louis are leading grain ports in the west, Buffalo, New York, and New Orleans, the points of trans-shipment.

The value of the **cotton** produced is often very nearly equal to that of the wheat. It forms **the first export**, the two-thirds of the whole crop which are sent to Europe constituting over one-fourth of all the exports of the United States.

Two kinds of cotton are grown, the **sea-island** and the **upland**, the former on the low sandy islands along the coast of Georgia, the latter mostly in the upland region that lies between the sandy plain and the interior highlands. The sea-island cotton is remarkable for the length and fineness of its fibre, and commands the highest price in the great cotton markets of the world.

New Orleans is the leading port for the shipment of cotton, but it is the chief article of commerce for Galveston, Mobile, Savannah, and Charleston. The manufacture of cotton in the United States is mostly done in the New England States, New York, and Pennsylvania, but in late years the amount manufactured in the cotton-growing states has rapidly increased.

Nearly the whole of the cotton belt is devoted to cotton; corn is its second crop. In southern Louisiana **sugar-cane** is grown, though not so favorably as in Cuba, where an acre will produce from three to six times as much sugar as here.

Some sugar is also made from sorghum, a plant resembling corn, and the cultivation of the sugar-beet in California and elsewhere is beginning to provide here a source of supply already much used in Europe. Maple sugar, made from the sap of the maple tree, is produced in the most northerly states from Maine to Michigan.

The amount of sugar made in the United States is about one-tenth the amount consumed, the balance being imported, mainly from the islands and countries lying to the south and from the Sandwich Islands.

Louisiana, Georgia, and South Carolina are the chief **rice**-growing states, but this crop is one of the least important.

The production of **oranges** and other sub-tropical fruits is receiving much attention, especially in Florida and in California.

Other fruits, such as apples, pears, plums, and cherries, thrive best in the section between the Chesapeake Bay and the Connecticut, and in the mild climates of southern Michigan and western Oregon. Peaches are a leading product of Delaware and New Jersey. Grapes, for the making of wine, are grown best in southern California, where the choicest of the European varieties flourish. In Missouri, Illinois, and Ohio grapes of native stock

are especially cultivated, and large quantities of table-wine are made.

Tobacco is grown in all the states. The largest producers are **Kentucky, Virginia, Pennsylvania, Ohio,** and **Tennessee.** In more northerly states, as Connecticut and Massachusetts, the culture is carried on with great skill, rich fertilisers being extensively used, and crops are raised reaching a value of two hundred dollars per acre.

Tobacco was the first paying article of export of the settlers in Virginia, and hence to it is due the successful foundation of that colony.

Hops are a crop of some of the most northerly states, New York leading. Flax is grown, for the sake of its oily seeds, in some of the states of the upper Mississippi and in the region west of the Cascade Mountains.

Forest Products.—The forests[1] of the United States cover about one-fourth the area of the country. This is a smaller proportion than is found in Sweden, Russia, or Austro-Hungary, but about the same as in Germany, and greater than in other European countries.

Pine, spruce, cedar, and **hemlock** are obtained in the northern part, Michigan, Pennsylvania, New York, Wisconsin, and Maine, and in western Washington and Oregon. Maine and Washington furnish much material for shipbuilding, the long spars and masts from the tall trees of the western coast forests being exported even to European navy yards. Much lumber from the Puget Sound mills goes to Australia, and from Maine to the West Indies, the exchange of barrels and casks for molasses and rum, having been a profitable traffic even in colonial times. Large quantities of hides from the La Plata States are brought to New England, New York, and Pennsylvania on account of the great abundance there of the hemlock bark used in tanning.[2]

In the other regions the leading production is of timber, boards, lath, and shingle for house-building. Throughout the eastern half of the Mississippi Valley and on the slopes of the Appalachians much hard wood, such as **hickory, maple,** and **walnut,** is cut and used in the manufacture of tools, machinery, wagons, cars, furniture, and in the interiors of buildings. Shipments of furniture have been made from Chicago to Scotland and of cars to South America. The southern or **yellow pine** is cut chiefly in Georgia, and is used for floors and in ships. **Live oak,** one of the toughest of woods, is also cut along the Gulf. The United States navy yard at Pensacola was established there on account of the abund-

[1] See p. 78.

[2] A further result is seen in the prominence of the shoe industry in the New England States.

ance of ship-building material so near. A fine-grained wood[1] found in Florida is used in making lead pencils.

In the prairie region and in the west the lack of timber is a great drawback, and efforts are made to encourage tree-planting by giving grants of land and respite from taxes. To protect the woods already grown from being cut down too wastefully is a matter that has already been acted upon by some State Legislatures, but a general Forestry Commission, after the model, perhaps, of some of those of Europe, is a pressing need. The yearly amount of lumber made is enormous, the products of sawmills being the fifth among manufactures.

Products of Mining and Manufacturing.—The **mineral wealth** of the United States is great. **Gold** is produced most extensively in **California**, where it was discovered in 1848.

The rush of miners which followed the discovery increased the population from a few thousands to over 90,000 in 1850, and by 1860 it was nearly 400,000. In later years the amount of gold has decreased, but, as in Australia, the inhabitants found other sources of wealth, and the products of farming and grazing are now of greater annual value than the gold.

After California, the most gold is produced in Colorado, Montana, South Dakota, and Nevada, and it is found in all the region along and west of the Rockies as well as in small quantities in the Appalachians. **Silver** is found in nearly all the gold-producing states, especially in **Colorado**, where it is found in connection with lead, in Montana, Utah, and Nevada.

Gold is always found pure, sometimes free in loose earth, in beds of streams, or where streams have been, and in this case it is obtained by the use of water; or it is found imbedded in quartz, and the more costly crushing process is necessary. Silver is nearly always found in combination with some other substance, as with lead at Leadville, Colorado. Mercury or **quicksilver** is found abundantly in the coast ranges of California, at New Almaden,[2] and elsewhere.

Copper is found most largely on the upper peninsula of **Michigan**, on Keweenaw Point, and on islands in Lake Superior, especially Isle Royale. These are the richest mines of this metal in the world, the copper being found in great masses and almost wholly pure.

[1] Called cedar, but properly a juniper.

[2] At Almaden in Spain was the chief quicksilver mine of the world, but California now produces more than half the world's supply.

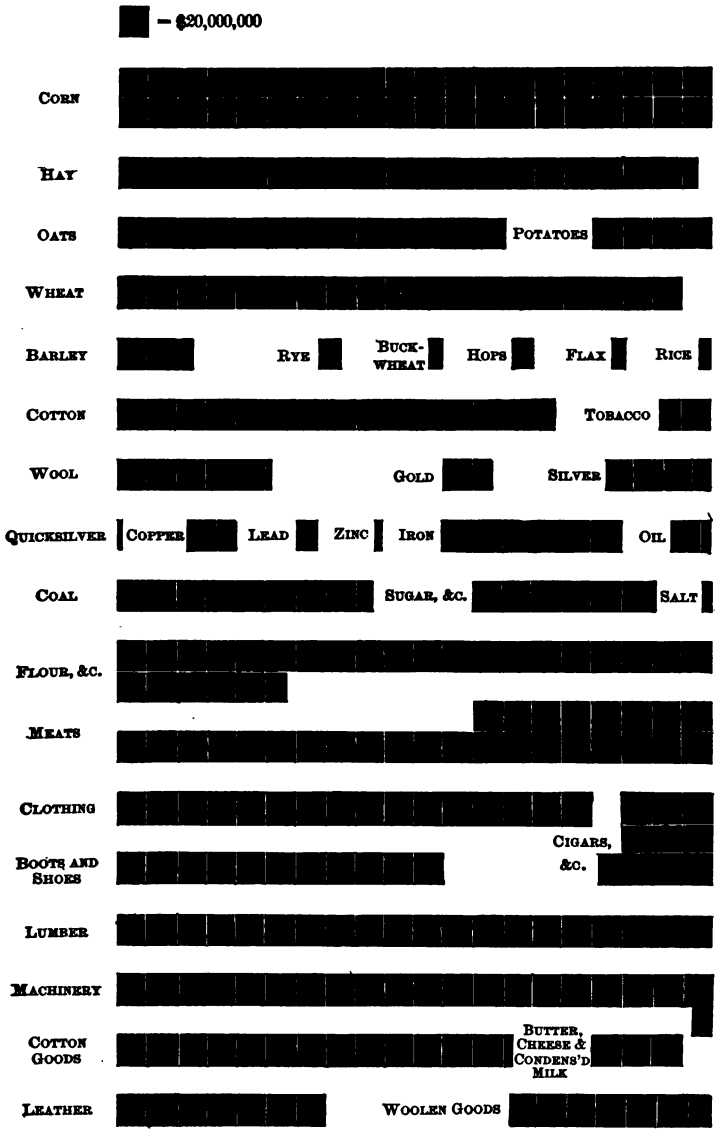


FIG. 27.—PRODUCTS OF THE UNITED STATES. (Annual Amounts.)

In **Montana** several rich deposits occur, those near Butte City being the chief. Copper is found also in nearly all the states and territories on the western highland, pre-eminently in Arizona.[1]

Lead is found in small quantities in the east, but most largely and widely in the Rocky Mountain region.

At **Leadville**, in Colorado, the greatest quantity is produced; Utah has great deposits, as have Missouri and Kansas in the Mississippi Valley. A less valuable lead region has done much to build up the towns of Dubuque in Iowa, and Galena, Illinois.[2]

Zinc is associated with lead in the mines of Missouri and Kansas, and occurs also largely in Illinois at Peru, and in several states of the Appalachian region, especially New Jersey.

The zinc oxide found in New Jersey is used in the manufacture of paint.

Tin, heretofore not found in paying quantities, is now being produced in South Dakota in the Black Hills, and in California.

Iron.—The greatest value, however, in any one metal product of the United States is in the **iron** that is made. The total amount of pig iron made yearly is nearly equal in value to the gold and silver together, and places this country next to Great Britain in this manufacture. The **Appalachian Mountains** are peculiarly rich in iron ore, all the states from New York to Georgia and from Ohio to Alabama containing large deposits. The great abundance of coal and lime in these mountains have long since made this the leading iron-making section of the country. Other rich iron-beds are in northern Michigan, Wisconsin, and Minnesota, where the high quality of the **Lake Superior ore** has raised the production of these regions to two-thirds of the total output of the country. In Missouri the famous Iron Mountain and Pilot Knob are but small parts of the iron wealth of the state.

In nearly all of the other mountainous states and territories iron ore has been found, but it has not as yet been mined to any great extent. Different kinds of iron ore are found in the different regions, and as a mixture usually makes a better product than a single ore, the iron of the Lake Superior beds, for example, is carried to Missouri, to

[1] See p. 121.

[2] These mines are spoken of as the upper mines, and those in Missouri as the lower mines.

Pittsburgh, or even to Alabama. Scotch iron is also imported for this purpose, and even iron ore from Algeria, Spain, and Greece.

Coal.—The **coal** area of the United States is several times larger than the area of that of any other country, so far as is known, except China.[1]

Two hundred thousand square miles is given as its size. The country with the next largest coal area is Canada, with about 65,000 square miles. India is third with about 35,000, Russia has 30,000, Australia 20,000, and Great Britain 12,000. In the amount of coal mined Great Britain leads with over 180,000,000 tons[2] yearly, while the United States raises above 160,000,000 tons.[2]

The chief coal-field is the Alleghany, which extends from northern Pennsylvania southward into Alabama and Georgia, with its greatest width between Cumberland, Md., and Akron, Ohio.

The coal of this field is **bituminous** or soft coal, and it is, as a rule, easily mined, some of the veins being of great thickness, as the Pittsburgh seam, eight to sixteen feet. This rich seam has made Pittsburgh the great center for such industries as need fuel, especially the making of iron and glass. The great amount of coal used early gave Pittsburgh the name "smoky city," but of late years the use of **natural gas** has largely taken the place of coal, and the name is not so appropriate. It is estimated that the use of this gas has saved in one year over ten million dollars' worth of coal. This gas is found usually in connection with petroleum, and, besides in Pennsylvania, in south-western New York, in Ohio, West Virginia, Indiana, Illinois, and even in southern California, and is used to furnish not only heat to factories and houses, but also light, whole towns having their gas-supply from this underground source. Some varieties of the Pittsburgh coal are also rich in gas, and are mined and sent to other cities for its manufacture. Out of the coal-tar which remains after the gas is extracted are obtained the beautiful aniline colours, naphtha, carbolic acid, and various other products, while the coke has great value as a fuel. In Alabama occurs a remarkable juxtaposition of iron, coal, and lime, which is fast making Birmingham a rival of Pittsburgh. In West Virginia, Ohio, Kentucky, and Tennessee are many mines, this Alleghany field giving out three-fifths of the bituminous coal used in the country.

In eastern Pennsylvania are the three chief **anthracite** coal basins, so small that their total area is less than 500 square miles, yet furnishing fuel to probably one-fourth the inhabitants of the Union. The value of their yearly output is greater than the greatest gold yield of California.

[1] The coal-fields of China are little developed, but may prove to have an area of between 200,000 and 400,000 square miles.

[2] Of 2240 lbs.

Pottaville, Mauch Chunk, **Wilkesbarre**, and **Scranton** are centers of mining and distribution. Much of this coal is carried by rail to Buffalo and shipped thence even to the remotest lake ports, and it was largely in order to enable easier shipments into New England that the Hudson was bridged at Poughkeepsie. A small quantity of anthracite coal is raised in Rhode Island and in Virginia. Anthracite coal contains less gas and more carbon than bituminous. It burns with great heat and no perceptible smoke.

Besides in the Alleghany field bituminous coal is found in Michigan, where are mines near Lansing. The great Illinois coal-field extends from the mines near La Salle, Illinois, southeast into Kentucky, with mines of excellent cannel coal at Brazil, near Terre Haute in Indiana, and of ordinary bituminous along the lower course of the Kaskaskia River.

In these prairie coal-mines the miners must always first work downwards in shafts, hence not so easily as in the Alleghany field, where the mines are often dug straight into a hillside.

The third great bituminous field, the Missouri, occupies parts also of Iowa, Nebraska, Kansas, Arkansas (where it contains some coal almost of the quality of anthracite), and the Indian Territory. A small deposit is found in Texas.

Between these fields and the Pacific, deposits, often from ten to twenty feet thick, of a kind of coal called **lignite** exist in nearly every state and territory. Lignite has less carbon than the bituminous coal, and more bitumen and gaseous matter. It does not make so hot a fire, but is mined considerably, especially in Colorado and Wyoming, in Washington, where bituminous beds also occur, and in New Mexico, where a sort of hard lignite or anthracite is found. Lignite is much used by the railway companies, who own many of the mines. Coal from Australia, however, finds a market in California.

Petroleum has its chief source of production in **Pennsylvania**; Titusville, **Oil City**, Bradford, and many smaller towns owing much of their prosperity to this one commodity.

From here and other points in the oil region the oil is conducted through iron pipes to refineries which are located at places convenient for shipping and marketing. Such pipes lead to New York, to Cleveland, Buffalo, and Pittsburgh, being usually laid alongside the railways. The refined oil is sent in tanks or barrels to all parts of the country, and to Europe and Asia. Petroleum is found also in Ohio, West Virginia, Kentucky, Colorado, Wyoming, and California. The United States is the chief petroleum-producing country, but in recent years great wells have been opened in Trans-Caucasia, and Russian petroleum now competes in Europe and in Asia with the American product.

Salt exists throughout the United States, being obtained from wells, as in New York and Michigan; from springs, as in Kansas; from salt lakes, as in Utah; from beds of rock-salt, as in Louisiana or Nevada;[1] or from lagoons on the sea-shore, as in Texas and California. In Texas, California, and Utah the heat of the sun and the dryness of the air are sufficient for the necessary evaporation. In the eastern states artificial heat is also used.

Michigan produces the most salt, the cheapness of the fuel there used being an advantage, for the salt-makers burn the refuse from the sawmills. In the Great Basin the inhabitants can in many places obtain a plentiful supply with no trouble other than collecting it from the surface, as do the Tuaregs in the Sahara. The finer grades used in dairying are, however, imported.

Besides the resources of the soil and climate, forests and minerals, the rivers of the United States are one of the foremost of its wealth-producers. The great amount of **water-power** which numerous streams that flow from the Appalachians provide has been the means of making the states of that region, especially the more northerly, prëeminent in manufacturing. Not only flour-mills and saw-mills are operated, but factories of every kind. Where the water-power is not sufficient or is badly located steam-power is used, and the total amounts of the two kinds of power used throughout the country are about equal, steam being used more largely west of the Appalachians and water east.

Manufactures.—In the total value of manufactured articles, **New York, Pennsylvania, Massachusetts, Illinois, Ohio,** and **New Jersey** are the leading states, but Massachusetts, Connecticut, and Rhode Island, the most densely peopled states, have the largest proportion of the population engaged in manufacturing. The leading manufactures, after **food stuffs,**[2] are **steel** and **iron,** which are especially Pennsylvania **products; clothing,** made in New York, Philadelphia, Chicago, Cincinnati and Boston; **lumber;**[3] **machinery,** in New York, Pennsylvania, Massachusetts and Ohio; **cotton goods;**[4] **leather;**[5] **boots and shoes;** and **woollen goods.**[6] Of the great manufacturing cities, the ten leading are **New York,** making especially clothing, food stuffs, printed matter, tobacco, and liquors; **Philadelphia,** textiles, sugar, and cloth-

[1] In the south-eastern part of Nevada is a cliff twenty-five miles long and in places several hundred feet high composed mostly of rock-salt.

[2] By food stuffs is meant flour and other products of milling, and provisions, such as beef, pork, &c. The total value of these two items is nearly one-fifth of all products that are classed as manufactured.

[3] See p. 125.] [4] See p. 124.] [5] See p. 125.] [6] See p. 123.]

ing; **Chicago**, food stuffs, clothing, and steel; **Brooklyn**, **sugar**; **Boston**, sugar and clothing; **St. Louis**, food stuffs; **Cincinnati**, clothing, food stuffs, and liquors; **Baltimore**, clothing, canned fruits, and fertilisers; **Pittsburgh**, iron, steel, and glass; and **San Francisco**, provisions, and a wide variety in small amounts. The annual total manufactured[1] is about seventy-five dollars' worth for each inhabitant, and nearly all are used in the country, manufactures forming but a small part of the exports.

Commerce.—The exchanging of products of one part of the United States with those of another part, or the **internal** commerce of the country, is much aided by (1.) the generally level character of the land, allowing railways and canals to be easily constructed wherever needed; (2.) the navigability of the rivers and lakes and their great extent through the low land; (3.) the numerous small bays, sounds, and estuaries that aid in coastwise navigation.

The **railways** of the United States have an aggregate length greater than all the railways of Europe, and, at the present rate of construction, will soon exceed all others in the world. Nowhere else have railways been so rapidly and extensively constructed. The reason lies in the many great improvements that have been made in the means of producing the necessaries of life, and the great opportunities offered by the rich natural resources of America. Thus if farmers are sure of producing a good crop of wheat in land now unoccupied, railways will be built through the land to carry first the machinery, by means of which the crop will be made ready, and then the grain back to the markets. A discovery of gold, as in the Black Hills, brings railways to Deadwood. The increasing production of the Pacific coast and the increasing trade with East Asiatic lands has led to the construction of several railways entirely across the Western Plateau. The fact that the bulk of the exports is derived from the Mississippi Valley and the South necessitates long carriage, and, as with the Pacific trade, in a west and east direction. In order to assist in building railroads across wide stretches of thinly-peopled country, Congress and various Legislatures have made large grants of the land across which the roads were to go. Through the sale of such land to settlers, the railway companies get direct aid, and also indirect benefit in the receipts from the traffic now established. Even in the more settled parts, the lack of good highways leads to the building of railroads for local use.

The great Pacific roads connect Puget Sound with Chicago and St. Louis, at each of which places the choice of a land or water route to the coast is to be had; also San Francisco with Chicago, St. Louis, and New Orleans, the last an ocean port.

[1] Not including food stuffs.

The eastern Trunk lines connect Chicago with Portland, Me., *vid* Montreal, and with New York, Philadelphia, Baltimore, and Boston, from each of which ports steamers leave for Europe; St. Louis with New York, Philadelphia, and Baltimore; and New Orleans with Savannah and Charleston. New York, on the Atlantic, Chicago, in the central valley, and San Francisco, on the Pacific, are the leading centers. The chief north and south lines are guided by the topography. In the east, lines follow the Atlantic slope and the great Appalachian Valley, connecting Baltimore and Norfolk with New Orleans. Parallel with the Mississippi are lines connecting Chicago and New Orleans. Along the eastern base of the Rockies the Union Pacific and the Southern Pacific are joined by a line from Cheyenne through Denver, and on the Pacific coast a line follows the great valley from Puget Sound to the south. Hundreds of other connecting lines make the advantage of cheap transportation felt in every town and village. The increasing cheapness of transportation has made it possible for the western farmer and the southern planter to raise the staple crops and depend on distant markets. The eastern farmer can get his grain from the west and devote his own land to the production of crops that a denser population makes profitable. Hence Delaware and New Jersey produce fruits and vegetables, largely for New York and Philadelphia; and the four counties with the greatest value of agricultural products are Lancaster and Lawrence in Pennsylvania, Worcester in Massachusetts, and Hartford in Connecticut.

At several points connection is made with the railways of Canada and with those of Mexico.

Of the **canals** the Erie is the most important, but in recent years the amount of freight carried upon it has much decreased. Its chief value is as a competitor to the railways parallel to it, since, where speedy delivery is not important, canal transportation is cheaper than railway. Wheat, lumber, iron, and coal are the chief freights. The Pennsylvania canals, extending along the Susquehanna and Delaware Rivers and their branches, carry chiefly coal, as do the Delaware and Hudson, the Morris and Essex, and the Chesapeake and Ohio. Those in Ohio and Indiana have become of little importance since the railways were built, being now used only as local conveniences.[1] The Illinois and Michigan

[1] The reservoir that burst and flooded Johnstown and other towns in southwestern Pennsylvania in the summer of 1889 was built to furnish water to a canal, but since the abandonment of the canal had been used as a pleasure and fishing resort.

Canal, if enlarged enough to admit the larger river steamers, will make it possible for a vessel to carry cotton direct to the factories in Canada, or iron ore from Lake Superior to the coal-fields of Missouri.

A large part of the inland commerce is done by means of steamers and barges on the rivers and Great Lakes. In this traffic St. Louis and New Orleans on the Mississippi, and Chicago, Milwaukee, and Buffalo on the lakes, are the chief points. Coastwise, traffic is much more important, especially along the Atlantic coast. The Pacific coast traffic is about one-third that of the rivers of the Mississippi System, or one-sixth that of the Great Lakes, while that of the Atlantic coast and rivers is but little less than all the rest, the Gulf having relatively little.

The vessels engaged in this traffic are owned entirely by Americans, since foreign vessels may not carry goods from one part of the United States to another.

The great amount of the inland or inter-state commerce may be partially understood when it is noticed that, out of a total production of manufactures, mining, and farm products of the value of about eight thousand million dollars, only about eight hundred millions worth, or one-tenth part, are exported. Hence the foreign commerce of the United States is relatively small when compared with its domestic trade.

Russia exchanges but one-sixth of its productions for those of other countries; France, nearly one-fifth; Germany, one-fourth; Great Britain, one-third; and Australia, over one-half. The great specialisation in production practised by the countries last mentioned gives them a surplus of certain articles, and by the export of the surplus, as wool from Australia, or manufactures from Germany or England, the different products of other countries are obtained.

In the absolute amount of **foreign commerce**, however, the United States is fourth among nations, Great Britain, Germany, and France preceding.

Its **chief exports**, in order of value, are **cotton, provisions, bread stuffs, petroleum,** and **cattle,** which together are about 73 per cent. of all. Manufactures of wood, iron, cotton, and leather make together about 9 per cent. American firearms, watches, sewing-machines, locks, tools, agricultural implements, cars, and engines are foremost in practicality and durability. One-half the exported articles are sent to Great Britain, Germany takes

one-tenth, and other countries smaller amounts. New York City leads in the foreign trade, having more than all other ports in value. After New York come San Francisco, New Orleans, Boston, Baltimore, and Philadelphia with from 14 to 5 per cent. each.

The **leading imports** are **dry goods**[1] from England, France, and Germany; **sugar** from Cuba, Hawaii, and Brazil; **coffee** from Brazil, Middle America,[2] and Java; **iron** and **steel** from Great Britain, Germany, and Belgium; **chemicals** and **drugs** from England and Germany; **hides** and **leather** from England and Argentine Republic; **raw silk** from Japan, China, and France, and **fruit** of many kinds.

Of lesser values are **tea** from China and Japan; **lumber** from Canada; **India-rubber** from Brazil, England, and Central America; **tobacco** from Cuba and Holland; and **precious stones**; this last item, the smallest mentioned, amounting to eight million dollars yearly, or a little over one per cent. of all imports.[3]

As showing somewhat of the relative importance of the leading industries, it may be stated that the number of persons in the United States engaged in commerce and in transporting goods is about 10 per cent. of all the occupied classes; twice as many are engaged in manufacturing and mining,[4] and four times as many are in farming and grazing.

The number engaged in the professions and in rendering various personal services is about the same as the number in manufacturing and mining, or half as many as those in agriculture.

Population.—The population of the United States, according to the census of 1890, numbers a few less than 63,000,000,[5] and in this respect places this country fourth among nations, China, India, and Russia leading.

At the first census, taken in 1790, the population was nearly four million, inclusive of 750,000 negro slaves. The white population consisted almost entirely of English stock, the other European countries having only a moderate representation, Germany's being the largest.

Germans were settled most largely in Pennsylvania, where they had founded Germantown. In the middle of the eighteenth century fully

[1] Dry goods is a term applied to woollen, silk, cotton, and linen goods.

[2] See note to p. 64.

[3] About one-third of the goods imported are free of duties; on the other two-thirds the duties are about one-half the value of the goods. Ships cannot be imported. There is no duty on exports.

[4] The miners are but 2 per cent of all.

[5] In 1880, fifty millions.

one-half the inhabitants of this colony spoke German, and it was at one time a question there as to whether that language or English should be official.

During the fifty years from 1790 to 1840 the growth of the population was very rapid, the number in the last year being seventeen million, or four times as many as in 1790. In this period there was very little immigration, the native Americans constituting the bulk of the white population. After the potato famine in Ireland there was a great emigration from that island to America, nearly one-fifth of the population leaving. The census of 1850 showed over two million foreign-born persons in the United States. In 1860 there were over four million, or about 13 per cent. of all, and an equal number of negroes; and nearly the same proportion existed in 1890 when the census showed 9,250,000 foreign born and 7,470,000 negroes, together about 27 per cent. of the total 62,622,000.

The various peoples coming to the United States seek naturally the same kind of climate and occupation as they were accustomed to in their native country. Hence nearly all the foreign element is found in the northern states, where the temperature is most like that of Europe and where similar occupations are carried on. The less distance to the northern seaports, Boston, New York, Philadelphia, and Baltimore, as compared with that to Charleston, Savannah, and New Orleans, leads to the same result.

The greater part of the two and three-quarters million **Germans** are in New York, Illinois, Ohio, Wisconsin, Pennsylvania, and Michigan, largely in manufacturing and agriculture. Chicago has the largest number of any city, but in Milwaukee they constitute a larger proportion than elsewhere.

Of the nearly two million[1] **Irish** the most are in New York, Pennsylvania, Massachusetts, and Illinois, especially in the cities. New York City has the largest number, it being often said to have more than even Dublin. Lawrence, Mass., has the largest proportion. About one-seventh of the Irish have engaged in farming, twice as many are in manufacturing, while as many as in both these occupations are classed as doing various kinds of service.

The natives of **Great Britain** and **Canada** who are in the United States number about two and one-tenth million,[1] and are found mostly in New York, Pennsylvania, Michigan, and Massachusetts. Manufacturing and mining occupy nearly a half, chiefly the French-Canadians, and agriculture a fourth part of them.

Minnesota, Illinois, Wisconsin, and Iowa contain the majority of

the million of **Norwegians** and **Swedes**, who are most largely farmers. Three hundred thousand from Russia, of whom nearly one-half are Poles, live largely in New York, Pennsylvania, Illinois, and Michigan. Of about two hundred thousand Italians, New York, Pennsylvania, California, and New Jersey have the majority.

A hundred thousand[1] **French** are settled chiefly in New York, Ohio, Louisiana, California, and Illinois, and an equal number of **Chinese** live principally in California and the neighboring states. The **colored population** is almost wholly in the states of the cotton-belt. In three states, South Carolina, Mississippi, and Louisiana, there are more negroes than white people; and in Alabama, Georgia, Florida, and Virginia the two races are nearly equal in numbers.

Government.—In government the United States form a republic, of which the official name is **United States of America.**[1] Under this term are included the forty-four states, four territories, the so-called Indian Territory, the District of Alaska, and the District of Columbia, containing the capital, Washington. The plan of government is laid down in the **Constitution**, a document prepared by an assembly of delegates from the thirteen original states in 1787, and adopted as the basis of government by the legislatures of these states. New states joining the Union accept the Constitution and are bound by it.

According to the Constitution, the laws of the United States are made by **Congress** or the Legislative Department, which consists of two bodies, the House of Representatives and the Senate. Members of the House are elected by the people, each congressional district sending one member, whose term continues two years. Some small states have population enough for but one representative. New York sends thirty-four. Each state sends two senators, so that the Senate consists of ninety members. Senators are chosen by the legislatures of the states; the term is six years, and the elections are so arranged that one-third the senators are chosen at the end of every two years. Congress meets on the 1st of December of each year in the Capitol at Washington.

The **President** is the head of the Executive Department, and his chief function is to enforce the provisions of the Constitution and to see that the laws made by Congress are carried into effect. He signs or vetoes bills that are passed by Congress, appoints the foreign representatives of the Government and various home officials and judges, makes treaties with foreign powers, and is commander-in-chief of the army and navy. In the more important appointments and in treaties confirmation by the Senate is essential. For advice and assistance the President selects the Cabinet of eight members. The President is chosen by the states, each state selecting electors according

[1] 1890.

to the number of representatives and senators that it has. The electors are chosen by direct vote of the people. The Presidential term is four years, as is also that of the Vice-President, who is elected at the same time as the President.

The Vice-President presides over the Senate, and becomes President in case the elected President dies. After the Vice-President the Secretary of State and the other members of the Cabinet are possible successors to the Presidency. The President resides at Washington, in the White House or Executive Mansion. The **Judicial Department** of the United States, or the Federal Courts, consist of the Supreme Court at Washington, with a chief-justice and eight associate judges, nine Circuit Courts, and sixty District Courts. The judges of the Courts are appointed by the President and confirmed by the Senate. The constitutionality of laws passed by Congress is, if questioned, decided by the Supreme Court.

Each state and territory has a governor, legislature, and courts, whose functions are similar to those of the corresponding branches of the National Government. A territory, however, receives a governor and judges appointed by the President, and sends to Congress only a delegate, who has no vote. Laws passed by a territorial legislature must be submitted to Congress. The District of Columbia is governed by three commissioners appointed by the President, who also selects the governor and other officials for the administration of the District of Alaska. In the Indian Territory the various tribes have their own forms of government, a general government for the whole territory not having yet been organised.

Religion.—Religion is in the United States subject only to the voluntary action of the people. The Government can neither aid nor oppose in matters that are simply religious.

Christianity is the prevailing faith, being represented by many denominations of Protestants and by the Roman Catholic Church. Judaism is professed by a small number. The total number of sittings in all places of worship in the United States is nearly equal to the number of the inhabitants.

Education.—Education is likewise a matter with which the general Government has directly very little to do. Government appropriations are made only for Indian education and for the training schools of officers for the army and navy, of which the two leading are the Military Academy at West Point on the Hudson and the Naval Academy at Annapolis, Md. Indirectly the Government has done much for education through extensive

grants of public lands for school purposes. Altogether about one twenty-fifth part of the total area of the country has been thus donated.

The amount of support which the public schools receive yearly from these grants is but a small part of the whole sum expended, a much larger amount being provided by direct taxation laid by states and territories, as well as by cities, counties, towns, and school districts.

Laws for compulsory attendance at elementary schools exist in several states, but not in all, and the quality of the schools varies considerably in different localities.

Secondary instruction is most largely given in private schools (academies, seminaries, &c., mostly with only English courses), of which nearly one-half are supported and controlled by the various religious denominations.

Next in number of scholars are the city high schools, the preparatory departments of colleges, the special college preparatory schools, and the Normal schools for teachers, which contain a large number of students not in the professional courses.

Of colleges and universities giving a liberal education there are nearly six hundred,[1] including those for women (or without doing so, nearly four hundred, many of which are co-educational).

Of those of high rank many have post-graduate departments and one or more professional schools of theology, law, or medicine connected with them. Thus Harvard, Yale, Boston University, Michigan University, and North-Western University have each the three professional schools, and a dozen or more institutions have both medical and law schools. Many other professional schools have an independent establishment. Science schools, as of agriculture, mining, engineering, and architecture, are also departments of colleges or independent. For the especial benefit of science-education Congress granted in 1862 a large amount of public land, the proceeds from which were, as a rule, given to one science school in each state. A large proportion of the colleges of the United States is under the patronage of religious denominations. Many, however, are unsectarian, especially those founded by states on the basis of the Congressional land grants.

[1] A diminution of this number by concentrating the funds of several colleges in one state for the support of one university of high grade is a proposition often discussed.

TABLE OF AREAS, POPULATION, AND OCCUPATIONS.

States and Territories.	Abbreviations.	Capitals.	Area.	Area Occupied by Farms.	Population in 1860.	Population in 1880.	Number of Towns of 8,000 Inhab. or more, 1880.	Population Engaged in Agriculture, Fisheries, and Mining.[1]	Population Engaged in Manufacturing and Mechanical Industries.[1]	Population in Trade and Transportation.[1]	Population Rendering Professional and Personal Service.[1]
North Atlantic Group.			Sq. Miles.	Sq. Miles.	In 000's.	In 000's.		In 000's.	In 000's.	In 000's.	In 000's.
Maine	Me.	Augusta.	33,040	9,656	661	649	8	86	80	37	53
New Hampshire	N. H.	Concord.	9,305	5,405	377	347	5	43	71	20	31
Vermont	Vt.	Montpelier.	9,565	6,868	332	333	3	56	30	15	28
Massachusetts	Mass.	Boston.	8,315	4,684	2,239	1,783	47	81	476	197	229
Rhode Island	R. I.	Providence. Newport.	1,250	733	346	277	10	13	82	27	35
Connecticut	Conn.	Hartford.	4,990	3,522	746	623	17	49	146	49	72
New York	N. Y.	Albany.	49,170	34,315	5,998	5,083	46	410	825	538	670
New Jersey	N. J.	Trenton.	7,815	4,158	1,445	1,131	20	75	224	120	152
Pennsylvania	Penn.	Harrisburgh.	45,215	28,694	5,258	4,283	44	453	629	324	553
Totals	.....	.....	168,665	98,035	17,402	14,508	199	1,245	2,566	1,317	1,823
North Central Group.											
Ohio	O.	Columbus.	41,060	36,488	3,672	3,198	29	429	331	195	317
Indiana	Ind.	Indianapolis.	36,350	31,816	2,193	1,978	18	331	139	93	163
Illinois	Ill.	Springfield.	56,650	47,653	3,826	3,078	24	456	319	247	331
Michigan	Mich.	Lansing.	58,915	23,102	2,094	1,637	20	309	162	103	186
Wisconsin	Wis.	Madison.	56,040	26,231	1,687	1,315	17	243	129	69	136
Minnesota	Minn.	St. Paul.	83,365	29,162	1,302	781	6	195	84	73	117
Iowa	Ia.	Des Moines.	56,025	47,644	1,913	1,625	12	330	90	88	124
Missouri	Mo.	Jefferson City.	69,415	48,094	2,679	2,168	8	405	153	140	187
North Dakota	N. Dak.	Bismark.	70,795	11,970	183	135	1	44	5	7	13
South Dakota	S. Dak.	Pierre.	77,650		329			71	10	13	30

Nebraska . . .	Neb.	Lincoln.	77,510	17,807	1,059	452	8	170	56	63	79
Kansas	Ks.	Topeka.	82,080	33,789	1,427	996	9	357	55	62	79
Totals . .	.....	.....	765,855	400,917	22,362	17,363	152	3,339	1,533	1,151	1,750
South Atlantic Group.											
Delaware . . .	Del.	Dover.	2,050	1,649	168	147	1	19	18	9	18
Maryland . . .	Md.	Annapolis.	12,210	7,738	1,042	935	4	105	103	69	117
District of Columbia . . .	D. C.	.....	70	18	230	178	1	2	23	29	47
Virginia . . .	Va.	Richmond.	42,450	29,851	1,656	1,513	9	272	78	58	144
West Virginia .	W. V.	Charleston.	24,780	16,127	763	618	3	130	31	23	40
North Carolina .	N. C.	Raleigh.	52,250	35,393	1,618	1,400	5	374	51	29	84
South Carolina .	S. C.	Columbia.	30,570	20,601	1,151	996	3	328	31	22	60
Georgia . . .	Ga.	Atlanta.	59,475	39,378	1,887	1,542	7	418	59	55	137
Florida	Fla.	Tallahassee.	58,680	5,741	391	369	3	66	18	15	37
Totals . .	.....	.....	282,535	156,496	8,858	7,598	36	1,714	411	309	684
South Central Group.											
Alabama . . .	Ala.	Montgomery.	52,250	31,020	1,513	1,262	4	381	39	36	85
Mississippi . .	Miss.	Jackson.	46,810	27,456	1,290	1,132	3	360	19	22	61
Tennessee . . .	Tenn.	Nashville.	42,050	31,502	1,768	1,542	5	337	58	54	105
Kentucky . . .	Ky.	Frankfort.	40,400	33,456	1,859	1,649	7	326	83	61	120
Arkansas . . .	Ark.	Little Rock.	53,850	23,268	1,128	803	4	256	22	22	47
Indian Territory	Ind. T.	.....	31,400	.....	1,179[2]	77	..	....	..	..	..
Oklahoma Ter. .	.....	Guthrie.	39,030	2,518	62	....	..	14	2	2	3
Louisiana . . .	La.	Baton Rouge.	48,720	14,912	1,119	940	3	241	42	41	100
Texas	Tex.	Austin.	265,780	80,323	2,236	1,593	11	422	58	77	129
Totals . .	.....	.....	620,290	244,450	10,973	8,997	37	2,347	323	315	650

[1] These columns show the working population. The figures include all above ten years of age who are engaged in some occupation.

[2] Not added in total. Partly white. Total Indians in U. S., 249,000.

TABLE OF AREAS, POPULATION, AND OCCUPATIONS—*Continued.*

States and Territories.	Abbreviations.	Capitals.	Area.	Area Occupied by Farms.	Population in 1890.	Population in 1880.	Number of Towns of 8,000 Inhab. or more, 1890.	Population Engaged in Agriculture, Fisheries, and Mining.[1]	Population Engaged in Manufacturing and Mechanical Industries.[1]	Population in Trade and Transportation.[1]	Population Rendering Professional and Personal Service.[1]
Cordilleran or Western Group.			Sq. Miles.	Sq. Miles.	In 000's.	In 000's.		In 000's.	In 000's.	In 000's.	In 000's.
New Mexico T. .	N. M.	Santa Fe.	122,580	1,252	154	119	..	37	4	5	19
Colorado . . .	Col.	Denver.	103,925	7,187	413	194	4	59	39	41	53
Wyoming . . .	Wy.	Cheyenne.	97,890	2,862	61	21	1	11	5	5	10
Montana . . .	Mont.	Helena.	146,080	3,069	132	39	2	26	12	12	23
Idaho	I.	Boise City.	84,800	2,034	84	33	..	19	4	4	8
Utah	U.	Salt Lake City.	84,970	2,068	208	144	2	34	13	11	19
Nevada . . .	Nev.	Carson City.	110,700	2,598	46	62	1	11	3	4	7
Arizona Ter. . .	Ariz. T.	Phœnix.	113,020	2,026	60	40	..	10	3	3	9
California . . .	Cal.	Sacramento.	158,360	33,480	1,208	865	9	161	115	101	167
Oregon	Or.	Salem.	96,030	10,796	314	175	2	51	23	19	32
Washington . .	Wash.	Olympia.	69,180	6,529	349	75	3	48	37	29	51
Totals . . .	....	.....	1,187,535	73,981	3,028	1,767	24	447	258	234	397
Alaska	....	Sitka.	577,390	....	30[2]	33[2]	..	....	....	....	....
Total for U. S. .	....	.....	3,602,270[2]	973,779	62,622	50,263	448	9,013	5,092	3,236	5,304

[1] These columns show the working population. The figures include all above ten years of age who are engaged in some occupation. (Census of 1890.)

[2] The total area, including all bodies of water, is about four million square miles.

[3] Not in total.

The various **subdivisions** of the United States, their areas, capitals, and population, are given in the preceding table. The column giving the agricultural areas shows the practical outcome of the topography, climate, and history, besides affording a basis of comparison. The number of cities and towns of more than 4000 inhabitants indicates density of population, social conditions, and the amount of industrial activity. The columns showing the number of persons engaged in the various classes of occupations gives a fair idea of the industrial development of the different states and groups, and in connection with the other columns affords material for many comparisons.

The states are easily grouped, according to topographic features and climate, into three main sections—the **Atlantic States**, the **Central States**, and the **Cordilleran** or **Western States**. The Atlantic group is subdivided into the **North Atlantic** and the **South Atlantic States**, the dividing-line being the southern boundary of Pennsylvania and Delaware Bay. Similarly the central group has its **North Central** and **South Central States**, separated by the Ohio River and the southern boundary of Missouri and Kansas.[1]

These five groups differ in many respects. In **density of population** the North Atlantic leads with one hundred and three to the square mile,[2] and is followed by the South Atlantic with thirty-one, the North Central with twenty-nine, the South Central with seventeen; while in the States of the Cordilleras there are but five persons to two square miles, or only twice as many as in the desert of Sahara. The North Atlantic group is the **chief manufacturing section**, about one-third of the working population being engaged in mechanical pursuits.[3] In the North Central States one-fifth of the population are so engaged, and in the two southern groups only one-tenth. The South Atlantic, South Central, and the North Central States are the **agricultural sections**, nearly seven-tenths of the population in the two southern groups being dependent on agriculture, and nearly one-half the population in the northern group. In the North Atlantic group

[1] Other terms used, as the Gulf States, the Lake States, the Rocky Mountain States, the Plateau States, and the Pacific States, are self-explaining. The six most north-easterly states are called also the New England States.

[2] Compare table on p. 370.

[3] Compare with totals of the other groups.

the proportion in agriculture is only one-fifth. Of the products of farming, grain, hay, potatoes, hops, butter, and cheese are most largely produced in the northern sections, and cotton, sugar, rice, and sweet potatoes in the southern.[1]

In the States of the Cordilleras mining and grazing are especially prominent.

The **foreign-born population** of the country is nearly all contained in the two northern groups, nearly all the negroes in the two southern, while the Cordilleran group has the greater part of the Chinese and Indians.[2]

The **city population** shows a striking contrast. Out of 448 cities of 8,000 or more inhabitants, 351 are in the two northern groups, 73 in the two southern, and 24 in the Cordilleran group. Comparing such cities with the total population it is found that while in the southern groups a little over one-seventh of the population is urban and in the Cordilleran group about one-third, no less than three-eighths of the inhabitants of the northern states are gathered into the towns and cities.

1. **Towns.**[3]—**Of the North Atlantic States.**—Superior advantages for commerce and manufacturing have grouped more than one-half of the population of these states into towns of 8,000 and over.

At the head of navigation on the Penobscot is **Bangor** (19),[4] the chief lumber and ice market of Maine; similarly, on the Kennebec, is **Augusta** (11), the capital of Maine, a manufacturing town. The falls of the Androscoggin have created **Lewiston** (22), and those of the Saco, **Biddeford** (14), both makers of cotton and woollen goods. **Portland** (36), on a high peninsula on Casco Bay, has a deep harbor, and is the leading commercial town of Maine.[5]

The Merrimac has favored the growth of many manufacturing towns,—in New Hampshire, **Concord** (17), the capital, **Manchester** (44), and **Nashua** (19); and in Massachusetts, **Lowell** (78), **Lawrence** (45), **Haverhill** (27), and **Newburyport** (14), the two last mentioned being on its navigable part. Cotton and woollen goods are most extensively made in these towns, and here, as in other factory towns of the East, there is a large proportion of foreign-born population, especially French-Canadians. The public and parochial schools are usually good; technical instruction, evening lectures and classes, and reading-rooms are provided, and in some towns, as Lowell, attention is

[1] See pp. 122–125.

[2] See pp. 81, 135.

[3] See pp. 60 and 61 on causes determining the sites of towns.

[4] The numbers in brackets after names of towns give the population in thousands according to the census of 1890.

[5] See p. 96.

given to furnishing suitable homes for the operatives. On the irregular and picturesque coast of Massachusetts have grown up **Gloucester** (25), with extensive fishing interests;[1] **Salem** (31), formerly the leading commercial city of the coast, and now a residential town of much historic interest; and **Lynn** (56) a center for shoemaking, with two hundred factories, and in many respects a suburb of Boston.

Other suburban towns are **Malden** (23), making India-rubber goods; **Cambridge** (70), with Harvard University; **Chelsea** (28); **Waltham** (19), with watch-factories; and **Quincy** (17), from which comes the Quincy granite.

BOSTON (448), the capital of Massachusetts, and one of the first commercial and manufacturing cities of the Union, occupies three peninsulas projecting into Massachusetts Bay, and is constantly extending inland. The site of the city was chosen by its founders on account of its advantages for commerce and its facilities for defence against the Indians. The irregular surface of the older portion is probably the reason for its crooked streets, for which the town is noted, but the newer parts, built on made land, are regularly laid out in long avenues and rectangular cross streets, while even in the old part much improvement was made after the great fire of 1872. Boston is 145 miles nearer to Liverpool than New York, but lacks equally good western connections, a defect remedied in part by the Hoosac Tunnel, which pierces the mountains that lie east of the valley of the Hudson.

The city is famous for the many scenes of historic importance enacted in and near it, of which Faneuil Hall, Old South Church, and Bunker Hill Monument are memorials. The high schools are especially well arranged, and the public library is next to the Congressional at Washington in size.

In the south-east of Massachusetts are **Taunton** (25), on the Taunton River, and **Fall River** (74), on Narragansett Bay, large manufacturers of iron wares and cotton. **New Bedford** (41), on Buzzard's Bay has numerous manufactures besides its extensive whaling interests. The Blackstone River is, like the Merrimac, lined with manufacturing towns, of which the largest are **Worcester** (85), in Massachusetts, on the Boston and Albany Railroad; and **PROVIDENCE** (132), Rhode Island, at the head of Narragansett Bay. Boots and shoes, iron goods, and textiles are extensively made, and in Providence much jewelry. **Newport** (20) alternates with Providence in being the capital city of Rhode Island, and is one of the most fashionable of summer resorts.

Connecticut contains many cities whose manufactures are similar to those of the neighboring states. Hardware and fire-arms are preëminent. **New Haven** (81), the largest city in the state, is a beautiful town, with considerable commerce, and is the seat of Yale University. **Bridgeport** (49) has extensive factories for the manufacture of sewing-machines and is a center of trade for the Housatonic Valley. In **Waterbury** (29) brass manufactures, in **Meriden** (22) silver-plated goods, in **New London** (14) fisheries are of chief interest.

On the Connecticut River is **Hartford** (53), the capital, with a

[1] The total value of the product of the Atlantic coast fisheries, including oysters, is about $33,000,000, or about one-half of one per cent. of the total productions of the country.

State-house, said to be the finest structure in New England. This is the richest city in the United States in proportion to number of inhabitants, and is largely interested in insurance companies. The clear water of the Connecticut is favorable to paper-making, which is carried on here, but not so extensively as at **Springfield** (44) and **Holyoke** (36) in Massachusetts.

In Vermont, **Rutland** (12) has extensive quarries of white marble, and **Burlington** (15), picturesquely situated on Lake Champlain, has a large trade in Canadian lumber, and is the seat of the University of Vermont. The capital of the state is **Montpelier** (3).

The spacious waterway of the Hudson, and the level belt of land that extends through Central New York westward to Lake Erie, were recognized routes for travel even by the Indians, and the most powerful tribes had their homes in this region. With the advantages of canals and railways and increased commerce, there has grown up here a series of cities and towns containing more than half the people of New York State.

NEW YORK (1515), on Manhattan Island and the mainland to the north; **BROOKLYN** (806), and **Long Island City** (31), on Long Island; **JERSEY CITY** (163), and **Hoboken** (44), just across the Hudson, and **New Brighton** (16), on Staten Island contain a population of about two and one-half millions, and constitute practically one city, though in two states and under separate municipal governments.

As the chief business section is the southern part of New York, means of rapid transit are a prime necessity. The Brooklyn Bridge connects New York with Brooklyn, and a tunnel is being built under the Hudson to Hoboken. Elevated railroads extend throughout New York and Brooklyn, and numerous ferryboats ply between the several cities. At the same time, quick trains upon the many railways that center here bring a large number of the surrounding towns into almost as close connection with the business part of New York as are its own up-town districts.

The greatness and importance of New York are due to its commercial advantages, its harbor being one of the best in the world, and most favorably located for trade with Europe and for handling goods for the great industrial sections of the United States.

The most important of the trunk-line railroads terminate at New York; the commerce from the Erie Canal and the Hudson and that coming by Long Island Sound meet here, and from the city's wharves go out a large majority of the ocean-steamers and sailing-vessels that connect the United States with commercially related countries, besides the numerous vessels engaged in the coasting trade.

The exports sent out from New York are largely agricultural products, grain, provisions, dairy produce, cotton, and tobacco, besides

petroleum; and the leading imports are groceries, dry goods, iron and steel, and hides, the latter largely from South America. A full list of New York's imports would include almost every commercial product of the world. Altogether, more than half the foreign trade of the country is done through this city. Two-thirds of the immigrants land here, special arrangements for their accommodation being provided on Ellis Island in the Bay, not far from the Battery. Besides the great commercial interests, which, moreover, make New York the chief money center also of the country, there is a great amount of manufacturing done, the products of which exceed in value those of any other American city.

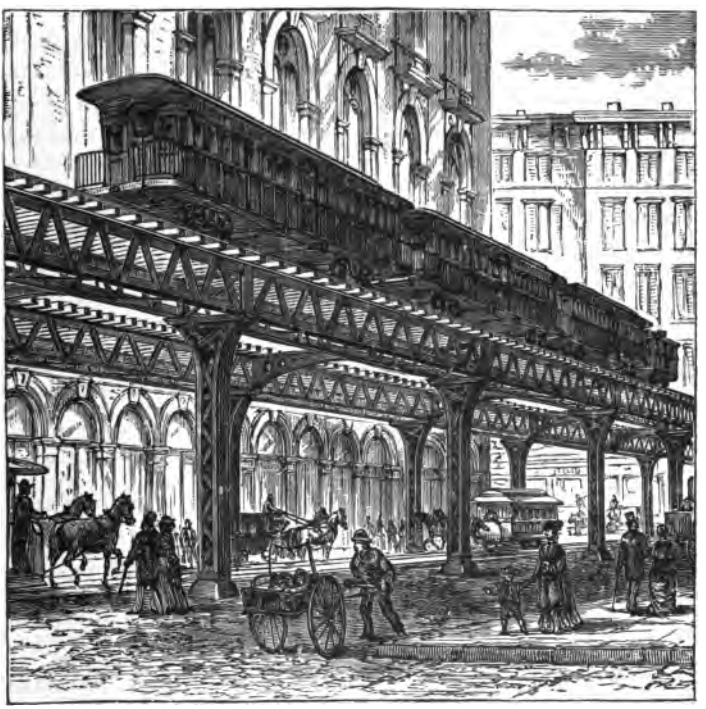


FIG. 28.—ELEVATED RAILROAD, NEW YORK.

The very long and narrow form of Manhattan Island, "a tongue that laps the commerce of the world," has brought about a peculiar arrangement of the trade and residential sections; the water-front being occupied by docks and warehouses, and the neighboring streets largely by tenements, there is left a long narrow central section divided among other interests. Along the middle line, Broadway and Fifth Avenue form the main thoroughfare, and monopolise so much of the traffic, and have along them so large a portion of the costly structures, that New

York is sometimes called the city of one street. Columbia College and the New York Normal College for training teachers are prominent among the educational institutions of the city.

Brooklyn is largely a residence city, although the storage warehouses which border its docks contain a greater value of goods than even those of New York, and it is fourth in importance in manufactures. The city forms a part of the customs port of New York, but has separate municipal organisation. Prominent among its features are the numerous churches, the spacious Prospect Park and Greenwood Cemetery.

From the center of the great Brooklyn Bridge is got a most comprehensive view of both the neighboring cities and of much of the surrounding region, together with a vivid impression of the varied activities that pertain to the commercial center of America.

On the sandy coast of Long Island, to the south and south-east of Brooklyn, are numerous seaside resorts, much frequented during the hot season.

Adjoining New York on the north is **Yonkers** (32), the home of many New York business men. Farther up the Hudson, **Newburgh** (23), rich in historic interest; **Poughkeepsie** (22), the seat of Vassar College, and the lowest point at which the Hudson is bridged;[1] **Kingston** (21), at the terminus of the Delaware and Hudson Canal; **Catskill** (5), a center of summer travel to the neighboring mountains; **Hudson** (10), with smelting furnaces.

ALBANY (95), the capital, at the eastern terminus of the Erie Canal, and where the Hudson is crossed by several bridges, is an important railway center, and a large market for Adirondack and Canadian lumber and Western cattle. North of Albany, at the falls of the Hudson and of the Mohawk, has grown up a cluster of manufacturing towns, **Troy** (61), **West Troy** (13), **Lansingburgh** (11), and **Cohoes** (23), with iron-works and many cotton and woolen mills. The Champlain and the Erie Canals have outlets at Troy. The Troy laundries owe their excellence largely to the clearness of the Hudson's water.

A few miles northward is Saratoga Springs (12), a leading health and fashion resort. Westward along the Mohawk are **Schenectady** (20), with Union College; **Utica** (44), a manufacturing town and center of trade for a rich dairying region, and **Rome** (15), handling much lumber. Farther west, **Syracuse** (88), the second salt-making center of the country, and a busy trading and manufacturing city at the crossing of several railroads; **Auburn** (26), beautifully placed on the outlet of Owasco Lake, and containing the great State Prison; **ROCHESTER** (134), at the last great falls of the Genesee, where the river is crossed by the Erie Canal, a flour-making and manufacturing town, and with extensive nurseries; **Lockport** (16), where the canal descends by a series of locks, the surplus water from which drives many mill-wheels. Near by are large limestone quarries. At the western end of the canal on Lake Erie, **BUFFALO** (256), an important point for the trade of the Great Lakes,[2] and hence a terminus for the chief railway systems of New York, and of several Pennsylvania roads.

[1] See p. 130.

[2] See pp. 116, 134.

North of central New York are but three localities that have been favorable to city growth. At the falls of the Oswego River and on the harbor at its mouth is **Oswego** (22), a grain port, with several starch-factories, and having canal connection with the Erie at Syracuse. The falls of the Black River furnish power to **Watertown** (15). **Ogdensburg** (12), on the St. Lawrence, is a grain and lumber port and point of connection between American and Canadian railways. In the south of New York are **Elmira** (30), with canals to Seneca Lake and to the anthracite coal-fields, and **Binghamton** (35), on the Susquehanna, at the terminus of the Chenango Canal, which joins the Erie at Utica. **Ithaca** (11), at the head of Cayuga Lake, is the seat of Cornell University.

The cities of New Jersey have grown up mostly in the northeastern part of the state, where they partake of the commercial advantages of New York and Newark Bays and their tributary streams, and where the Pennsylvania coal supplies are within easy reach. Many of them are in a measure dwelling-places for New York business men.

JERSEY CITY (163), opposite New York, is the terminus of many railroads, and the starting-point of several lines of ocean steamers. Exceeding Jersey City in size is **Newark** (182), on the Passaic River and Morris and Essex Canal, with numerous factories, among which those of leather goods, and jewelry are preëminent. Farther up the same stream, at its powerful falls, lies **Paterson** (78), with the largest silk product of the country and extensive locomotive works. To the west and south are **Orange** (19), and **Elizabeth** (38), both handsome residence towns, the latter with sewing-machine works. At the head of navigation of the Raritan River and at the terminus of the Delaware and Raritan Canal is **New Brunswick** (19), with the greatest rubber-works of the country. Where the Delaware becomes navigable stands **Trenton** (57), the capital, making use of an extensive clay deposit to produce a large part of the pottery and china-ware used in the states. Between New Brunswick, which contains Rutger's College, and Trenton lies Princeton (3), with the College of New Jersey. **Camden** (58), opposite Philadelphia, is really a suburb of that city. **Long Branch, Atlantic City** (13), and other resorts have great summer populations, but become quiet villages after the bathing season.

Pennsylvania's wealth of iron and coal has made its towns preëminently manufacturing.

PHILADELPHIA (1045), the third city in size in the United States, is a great industrial center. Its commerce is less than that of New York, for the Delaware, though here a mile wide and of good depth, is frozen in winter, hence the trunk-line railroads entering the city extend to tide-water on New York Bay. In manufactures Philadelphia has superior advantages, being especially favored by nearness to the great iron and coal beds, by excellent means of transportation, canals, rivers, and railroads, and by the cheapness of living. The region about is renowned for its fruitfulness, and as

the city is built on a level plain along the Delaware and Schuylkill, it can expand without hindrance, and consequently land is not so expensive as on the narrow Manhattan Island. There is on the average one house to every five persons in Philadelphia, and but one to fifteen persons in New York. The beautiful suburban sections are especially attractive, and Fairmount Park, of 3000 acres, is like a stretch of open country. The University of Pennsylvania and the famous Girard College are in Philadelphia. Below Philadelphia, on the Delaware, are **Chester** (20), and **Wilmington** [1] (61), Delaware, both with extensive works for building iron ships, the latter town making also railway cars and gunpowder.

The valley of the Schuylkill is the natural route from the coal and iron fields to Philadelphia, and it is lined with furnaces and manufacturing towns.

Reading (59), the largest, occupies a most picturesque situation, and is the converging point for several railroads, one of which brings iron ore from the rich Cornwall ore banks to the west, and others coal from **Pottsville** (14), the center of a region shipping ten million tons a year. The Lehigh Valley, in which anthracite coal was discovered, is similarly occupied, and contains also zinc-works and slate quarries (Slatington).

Along the eastern bend of the Susquehanna and in the Lackawanna Valley are **Scranton** (75), and **Wilkesbarre** (38), among numerous coal towns in a region so rich in this fuel that six great railways have forced their way into it.

Williamsport (27), on the west branch of the Susquehanna, is the greatest lumber market of the state. **Harrisburgh** (39), the capital, where the Susquehanna is a mile wide, receives lumber, iron, and coal by river, canal, and rail, and is a manufacturing and distributing center. **Altoona** (30), half-way between Harrisburgh and Pittsburgh, in a district rich in coal and iron, are extensive railway shops of the Pennsylvania road.

Where the Alleghany and Monongahela unite to form the Ohio, **PITTSBURGH** (239), and **ALLEGHENY** (105), share the advantages of navigation to the Gulf, and of rich coal, iron, oil, and gas supplies.[2]

Erie (41), the only lake port of Pennsylvania, has a large harbor sheltered by the long natural breakwater of Presque Isle.

2. **Of the North Central States.**—The commercial advantages of the Great Lakes are the cause of much of the prosperity of many of the cities of this section, and the Ohio and Mississippi Rivers have attracted a large population to their valleys.

CLEVELAND (261), **Sandusky** (18), and **Toledo** (81), are the chief lake towns in Ohio. Cleveland is a receiving point for iron, coal, oil, and live-stock from Pennsylvania and Ohio, and a large part of the valuable Lake Superior iron ore comes here for transshipment to the furnaces of the Appalachians.[3] The city has iron-works, refineries,

[1] Properly in the South Atlantic group. [2] See pp. 129, 130.

[3] The geographical center of the iron-producing regions of the country lies not far from Cleveland.

and packing-houses, is one of the handsomest cities in America, and contains Adelbert College. Its water-supply, like that of Chicago, is obtained by means of a tunnel under the lake.

Sandusky is the leading market for fresh fish from the lakes, and is in the midst of a rich wine-making region. **Toledo** draws largely on the resources of the forests of northern Indiana and Michigan, and is a center to which more than a dozen railways bring lumber and grain for water-shipment. Its wagon-works are the largest in the country, and its grain receipts less only than those of Chicago, St. Louis, and Minneapolis. Natural gas is used here as a fuel. On the Ohio River below Pittsburgh are **Wheeling** (35),[1] in West Virginia, with industries like those of Pittsburgh, and farther down several small cities with coal and iron, of which **Portsmouth** (12) has canal connections with Cleveland.

At the great northern bend of the river, half-way between Pittsburgh and Cairo, and almost on a line with St. Louis and Philadelphia, is **CINCINNATI** (297), the metropolis of the Ohio Valley. The city is built on a series of natural terraces rising up from the river, and contains many handsome structures. Its great bridges over the Ohio connect with it **Covington** (37) and **Newport** (25), in Kentucky, which thus share in the advantages of the situation. Numerous railroads center here, and from the products of the surrounding region iron and wooden wares, tobacco, whisky, beer, clothing, and provisions are manufactured.

Columbus (88), the capital of Ohio, in a central location on several railways, has considerable wholesale trade, and manufactures especially carriages, and the interior of the state contains also a number of other cities—**Dayton** (61) and **Springfield** (32), in the basin of the Great Miami, being the largest. Both are engaged in various manufactures, especially those combining wood and iron. The agricultural implements made here are sold throughout the West, and many go eastward. In Indiana, the capital, **Indianapolis** (105), is the largest town. It stands in the midst of the corn belt, and its receipts of grain and live-stock place it among the first five collecting points. Coal-mines are near by at Brazil, and the city manufactures for the trade of the surrounding country.

On the Ohio are **New Albany** (21), utilizing the same falls that have built up Louisville in Kentucky; and **Evansville** (51), at the head of navigation during the dry season. **Terre Haute** (30), up to which the Wabash is navigable, is, like Indianapolis, a center of trade and manufacturing in a rich farming region.

The Wabash and Erie Canal leads from here to Toledo, and on it, in the north-east of the State, is **Fort Wayne** (35), a crossing point of several railways, with extensive car-shops. **South Bend** (22), at the falls of the St. Joseph, utilizes the hard woods of Indiana and Michigan in making wagons and carriages.

CHICAGO (1100), Illinois, has a situation of great superiority for commerce. Its water connections reach eastward to the Alantic and southward to the Gulf. It lies almost at the center of the great agricultural prairie region; to the north are forest regions and mines

[1] Of the South Atlantic group.

of copper and iron; to the south, coal. More than twenty railways bring to the city the various products, and Chicago is at once the leading grain, provision, and lumber market, as well as the greatest railway center of the world. In population it is the second city in America.

Its manufactures are also great, its products in this industry being, in 1880, equal in value to the farm products that it shipped. Chicago was chartered as a city in 1837, having then about 4000 inhabitants. Its growth since then has been the most rapid ever known, and the great wealth that has been accumulated is shown by numerous magnificent buildings. A series of parks connected by boulevards extends entirely around the city, from the shore of the lake on the north to the shore on the south. The city's water-supply is derived from the lake by means of a long tunnel, and is forced by strong pumps to a height of 160 feet to get the necessary fall.

About ten miles south of Chicago is the suburb of **Pullman**, containing the shops at which are made the Pullman cars, but especially interesting as a model village, built entirely by the company for the workmen, and equipped with everything necessary to their comfort and entertainment. Much of the building-stone used in Chicago comes from quarries at **Joliet** (23), about forty miles to the south-west.

The coal of Illinois has made manufacturing an industry in nearly all its cities.

Peoria (41), at the head of navigation on the Illinois River, overlooking an expansion of the stream called Peoria Lake, is a prominent railway center, and is extensively engaged in distilling whisky. The amount of internal revenue paid here is at times as great as that at Cincinnati. **Springfield** (25), the capital, **Elgin** (18), and **Rockford** (24) have watch-factories. **Bloomington** (20), **Aurora** (20), and other towns make railway cars.

On the Mississippi, **Rock Island** (14), with excellent water-power, and containing the largest of the U.S. arsenals; **Quincy** (31), on a limestone bluff overlooking rich bottom-lands; and **East St. Louis** (15), are points at which the river is bridged, and which have considerable river commerce.

Cairo (10) was built at great expense on swampy land at the junction of the Ohio and Mississippi, levees being necessary to protect the city from floods. The wharves of Cairo are yearly visited by many hundred river-steamers.

The commercial facilities of the Great Lakes, besides producing Buffalo, Chicago, Toledo, and Cleveland, have built up **DETROIT** (206), in Michigan; **MILWAUKEE** (204), in Wisconsin, and many lesser cities, of which **Duluth** (33), in Minnesota, has the advantage of being the nearest shipping point for the products of the Red River Valley and a wide surrounding region. All these towns, except Buffalo, it will be noticed, are on the west or south-west of the lakes, and east and north-east of

the regions they serve as collecting points. For the movement of trade has been constantly to and from the east, and each town lies between the country dependent on it and the eastern markets.

Detroit, on the Detroit River, where it is crossed by the trunk-lines from Chicago to Buffalo and Montreal, is one of the leading points for collecting and shipping grain. It manufactures a great deal also in tobacco and iron, its tobacco-factories being the largest in the Union. Much lumber is made, and copper ore from the Upper Peninsula is brought to Detroit to be smelted.

Bay City (28), **West Bay City** (13), and **Saginaw** (46, with East Saginaw) form a group of towns interested in lumber and salt.[1] The strata yielding salt are continuous with those appearing in New York at Syracuse and elsewhere, and in Ontario at Goderich. The remarkable system of rivers that flow from the north, west, south, and east and center at Saginaw puts a large area of rich pine-lands under contribution to the mills of these towns.

Another lumber town is **Muskegon** (23), at the mouth of the Muskegon River, making two-thirds as much lumber as is made in the Saginaw district. At the powerful falls of the Grand River, and at the head of its navigation, is **Grand Rapids** (60), a town that makes much furniture besides lumber and brushes. Extensive gypsum beds lie near the town. Coal deposits exist in the neighbourhood of **Lansing** (13), the capital, and **Jackson** (21). The University of Michigan is at **Ann Arbor** (9). **Marquette** (9), on Lake Superior, is the chief shipping point for the rich iron ore of the Upper Peninsula.

Milwaukee has a spacious harbor on Milwaukee Bay, and is fourth among the grain-collecting places, being a centre for numerous railways that extend far to the west and the north-west. The city is famous for its beer, but both the leather and flour made there precede in value. Much pork is packed here, and much tobacco manufactured. As a residence town Milwaukee is particularly attractive.

Racine (21) has a portion of Wisconsin's lake commerce, and does some manufacturing. **Oshkosh** (23), on Lake Winnebago, at the mouth of the Fox River, has, like Saginaw and Muskegon, an enormous output of pine lumber.

Madison (13), the capital and seat of the University of Wisconsin, is picturesquely situated between small lakes, and is widely known as one of the most healthful of residential towns. **Lacrosse** (25), on the Mississippi, builds a great many steamboats for the river trade, and ships much lumber and ice.

MINNEAPOLIS (165), and **ST. PAUL** (133), in Minnesota, form the most northerly of the three large aggregations of population that have grown up on the Mississippi River. Farther south are **ST. LOUIS** (452), in Missouri, and **NEW ORLEANS** (242), in Louisiana.

[1] See p. 131.

These four towns contain over four-fifths of the population of the Mississippi cities. It will be noticed that the city population north of the mouth of the Ohio is more largely on the west bank of the river, in situations adapted to gathering products from lands to the west for shipment eastward. South of the Ohio, on the contrary, the cities are on the east bank, since here the cotton crop, grown mostly east of the river, finds its readiest outlet by means of the river.

St. Paul, the capital of Minnesota, is at the head of the continuous navigation of the Mississippi, and is a railroad and commercial center of great activity. Its trade reaches far to the west, and its shipments of grain by rail and by water are very large. The city is handsomely built upon a succession of terraces that rise up from the river.

Minneapolis owes its prosperity largely to the Falls of St. Anthony, at which the river makes a descent of about eighty feet within one mile. Sawmills utilise this force, and still more flouring-mills, and the superior quality of the hard wheat used, together with the most improved methods of milling, have given Minneapolis flour a high reputation. The University of Minnesota is at Minneapolis.

Between St. Paul and St. Louis, on the west of the Mississippi, in Minnesota, are **Winona** (18); in Iowa, **Dubuque** (30), near lead-mines; **Davenport** (27), opposite Rock Island; **Burlington** (23), **Keokuk** (14), with water-power from the canal around the rapids; and in Missouri **Hannibal** (13). At each of these towns the Mississippi is bridged for railway traffic.

Two of the rivers that flow across Iowa, the Cedar and the Des Moines, have developed each an industrial and commercial town, **Cedar Rapids** (18) and **Des Moines** (50); the latter is the capital and a railway center.

At the western edge of the state, **Council Bluffs** (21) shares with **OMAHA** (140), in Nebraska, the advantages of being where the great trunk lines from Chicago converge, to be continued on to San Francisco by the Union and Central Pacific roads. These cities are built in the valley of the stream at the foot of the steep bluffs, are connected by a long bridge, and for a part of the year have navigation to St. Louis as well as into Montana. At Omaha are smelting-works for silver and lead, and considerable manufacturing and trading is done in each city.

Lincoln (55), the capital of Nebraska, is the seat of the University of Nebraska. On the Missouri, in South Dakota, is **Yankton**, near the mouth of the James River. **Deadwood**, in the west of the state, owes its prosperity to the gold mines of the Black Hills. In North Dakota, **Bismark**, the capital, is located at the crossing of the Missouri by the Northern Pacific Road.

Where the Missouri forms the boundary between Kansas and Missouri stand **St. Joseph** (52), in Missouri, and **Atchison** (14) and **Leavenworth** (20), in Kansas, each an important railway point, with bridges across the stream. Furniture is a leading manufacture in all of

them, material being obtained from forests in southern Missouri. On the Kansas River are **Topeka** (31), the capital of Kansas, an important railroad town with a large production of steel rails, and **Lawrence** (10), with the University of Kansas. At the confluence of the Kansas and Missouri is **KANSAS CITY** (133), Missouri, one of the first collecting points for grain and live-stock, with extensive packing-houses and manufactories. Farther south-west is **Wichita** (24), on the Arkansas, with a large development of industries like those of Kansas City. **ST. LOUIS** (452) has a situation especially adapting it to be a receiving and distributing point for a large region. Located nearly in the center of the Mississippi Valley, it was early in command of the trade of the Missouri, the upper Mississippi, and the Illinois rivers; but the building of railroads has taken a part of this trade to Chicago. The roads that reach out from St. Louis to the west and south-west, however, have laid other extensive areas under tribute, and the building of elevators and the establishment of barge-lines to New Orleans have greatly increased the city's shipping facilities. St. Louis is the second largest grain-collecting point, and it is a strong rival of Minneapolis in flour-making. Great numbers of live-stock are brought here, and much beef and pork are packed. Coal, lead, and iron are found near by in abundance, while leather, lumber, tobacco, and cotton are heavily dealt in, and there are many breweries and sugar-refineries. All the railroads entering St. Louis from the east cross the Mississippi on the great tubular bridge, a structure remarkable for its size and plan, and carrying two lines of rails, as well as a wide roadway. From its west end a tunnel leads to the Union Depôt in the heart of the city, whence the trains of some twenty roads go westward. St. Louis was founded by French traders in 1764, but in 1830 it had not 6000 inhabitants. Hence it is within a comparatively short time that its population has been accumulated, and a great proportion, nearly one-third, is foreign-born.

3. **Of the South Atlantic States.**—The two southern groups of States, with industries so largely agricultural, have a large rural population and but comparatively few large towns.[1] Of the eight great cities of the Union, but one is in the South Atlantic States and one in the South Central. The development of manufacturing is, however, beginning to increase the urban population.

The chief city of the South Atlantic group of States is **BALTIMORE** (434), Maryland. It lies on the estuary of the Patapsco River, and has an excellent harbor, from which vessels reach the open sea either *viâ* Chesapeake Bay or by way of the Chesapeake and Delaware Canal and Delaware Bay. Several lines of steamers ply between Baltimore and European ports, and the city is a terminal point of a railway system that reaches to Chicago and St. Louis, as well as of other systems that extend into the cotton belt. Coal and iron are easily obtained, and much manufacturing is done, machinery, ships,

[1] See table, p. 141.

flour, and tobacco being among the chief products. Fruits and vegetables and oysters from Chesapeake Bay are canned for shipment, and quantities of fertilizers made. The Johns Hopkins University is in Baltimore. At **Annapolis** (7), the capital of Maryland, is the United States Naval Academy. **Cumberland** (13), at the west end of the Chesapeake and Ohio Canal, is in the midst of the coal-fields of the state.

The Federal capital, **WASHINGTON** (230), in the District of Columbia, is almost entirely a residence town, having very little of either manufacturing or commerce. The population consists principally of members and officials of the Government and of army and navy officers. The city was founded solely for governmental purposes, and in order to avoid the jealousies that would arise were any existing city made the capital of the nation. Its streets cross one another at right angles, and are further intersected by broad avenues, which radiate in all directions from the central point, where stands the Capitol. With its numerous and magnificent Government buildings, its broad avenues, and many monuments, Washington is the most imposing city in America. One of the largest of the Government navy yards is located here, and a few miles down the Potomac is Mount Vernon, the old homestead of General Washington. Howard University, for the colored race, is one of the prominent educational establishments of the capital, and the Congressional Library is the largest in America.

Richmond (81), Virginia, at the head of navigation of the James River, has fine water-power,[1] and manufactures considerable quantities of flour, tobacco, machinery, and fertilizers. The city is a railroad center, and a collecting and exporting point for cotton, flour, petroleum, and tobacco.

Norfolk (35), and **Portsmouth** (13), separated by the Elizabeth River, have one of the best harbors on the coast. Norfolk is the terminus of an important railway system, and has a large coast trade, sending many garden products to northern cities. In Portsmouth is a Government navy yard, and from here extends the Albemarle Canal through Dismal Swamp to the Sound.

Petersburg[1] (23) and **Lynchburgh** (20) are largely interested in tobacco manufacture, and the former town has cotton factories also.

In North Carolina, **Raleigh** (13), the capital, is in the midst of the cotton-growing region, and **Wilmington** (20) has a good harbor, and exports cotton, lumber, and naval stores.

Columbia[1] (15), the capital of South Carolina, at the head of navigation of the Congaree, has good water-power, and is the seat of South Carolina College.

Charleston (55) is the chief commercial town of the South Atlantic States. It lies on a flat island between two rivers, a position similar to that of New York; its harbor is excellent and well protected, and the city is an important railway center. Cotton is exported in considerable quantities. The leading manufacture is lumber.

Savannah (43), Georgia, about twenty miles from the sea on the Savannah River, has exports like those of Charleston and Wilmington, with the addition of rice. Much guano is imported.

Augusta (33), at the end of the navigable part of the Savannah,

[1] See p. 113.

utilises its water-power [1] in cotton manufacturing. **Macon** (23) and **Columbus** (17) have resources and industries like those of Augusta.

Atlanta (66), the capital of Georgia, is the most important railroad center of the south-eastern states, has a large trade, and is steadily gaining in manufacturing. The mild and healthful climate of Atlanta attracts many winter residents.

Jacksonville (17) and **St. Augustine**, in Florida, are likewise much visited by invalids. The latter has a large trade in fruit. **Key West** (18), the most southerly town of the United States, handles sponges, tortoise-shells, and especially tobacco. The capital, **Tallahassee**, is the site of the State University.

4. Of the South Central States.

Mobile (31), Alabama, has an excellent harbor, and exports much cotton, lumber, and naval stores. Coffee is one of the imports. Above Mobile the Alabama River is navigable to the capital, **Montgomery** [1] (22), an important railway town and cotton center. **Birmingham** (26), [2] in the northern part of the state, has recently come into prominence as an iron-making town, the products of its furnaces competing easily in the Northern markets with Pennsylvania iron.

In Mississippi, **Jackson** (5), the capital, is in the midst of the cotton-growing part of the State. **Vicksburg** (13) and **Natchez** (10) are the chief points on the river, and ship much cotton to New Orleans.

Memphis (64), Tennessee, on high bluffs overlooking the river, is the most important commercial town between St. Louis and New Orleans. It has extensive railway connections, and handles much cotton, its wharves being reached by ocean-going steamers although over 800 miles above New Orleans. Cotton-seed oil is made extensively.

Chattanooga (29) has extensive resources in iron and coal and in the forests near by. Its manufactures find shipment on the Tennessee River and by several railroads.

Nashville (76), the capital of Tennessee, can be reached by boats on the Cumberland during high-water. It is a busy manufacturing and trading town in the center of a fertile region. Iron, cotton, grain, tobacco, and hemp are the chief products dealt in. Nashville is the seat of Vanderbilt University, and of two others, Fisk and Roger Williams, that are devoted to the education of the colored race.

LOUISVILLE (161), Kentucky, is situated where falls in the Ohio made trans-shipment of goods necessary. A canal now allows the passage of boats, and having excellent railway connections, Louisville has become a prominent commercial town, sending grain and manufactures to the south. Its manufactures are similar to those of Cincinnati, though of less quantity, and it is the leading tobacco market of the world.

Lexington (22), near the capital, **Frankfort**, is in the midst of the blue grass region, so famous for good horses, and is also the seat of the Kentucky University.

In Arkansas, the capital, **Little Rock** (26), has a large trade in cotton,

[1] See p. 113. [2] See p. 129.

grain, wool, hides, and lumber, and in general merchandise. But little manufacturing is done, the development of the state having been almost entirely agricultural.

Hot Springs (8) is visited by many invalids in winter for the sake of the baths.

Shreveport (12), Louisiana, is, like Little Rock, the center of trade for an extensive agricultural section. The Red River is navigable to the city during about eight months of the year.

Baton Rouge (10), the capital of Louisiana, is the seat of the State University. As a commercial town it handles principally cotton and sugar.

NEW ORLEANS (242) is preëminently a commercial city. As a seaport it stands in somewhat the same relations to St. Louis that New York does to Chicago, exporting the products collected at the inland city; and it is also a railway center, the systems of the lower Mississippi Valley, of the Gulf States, and even Pacific and Mexican roads sharing in the commerce of the city.

The products marketed here are mostly agricultural; hence the autumn is the busiest season, and then cotton and corn, flour, pork, tobacco, whisky, sugar and molasses, and barrel staves are brought here in enormous quantities and shipped to European and other ports. The imports are much less in amount, and consist mainly of sugar and coffee. Cotton-seed oil is the chief manufacture.

The city is built along a bend of the river, whence the title Crescent City. The level of the streets is some four feet lower than high-water, against which the levees afford protection; the drainage leads away from, instead of into the river. The residence part of the town extends over an area as large as New York; the streets, mostly unpaved, are shaded by trees, many of which are fruit-bearing; while the houses or villas stand detached, and are surrounded throughout the year by foliage and flowers.

The population has a large element of the French creole, and their language, many customs, and much of the older architecture, together with the city's name, are constant reminders of the early history. Here occur the famous Mardi Gras carnivals, with their strange symbolical representation of history and myth.

The cemeteries are unique in that there are no graves, on account of the lack of deep drainage, but tombs of stone or brick built above the surface.

New Orleans is the seat of Tulane University, as well as of three others that are especially intended for negroes.

Galveston (29), Texas, upon a sandy island at the entrance to Galveston Bay, is reached by a railway from the mainland, and is the chief commercial town of the State. Its harbor admits large ships. The exports consist almost wholly of cotton; coffee is the leading import.

Houston (28) has a good harbor, and lying in the midst of a fruitful region, is a center of trade.

San Antonio (38), an old town with a considerable Spanish element in the population, has especially Mexican trade, and deals largely in cattle.

Austin (14), the capital, is picturesquely situated at the head of

navigation on the Colorado, and is the seat of the State University. At **Laredo** (11) and at **El Paso** (10) connection is made with the railway system of Mexico.

5. **Of the Cordilleran or Western States.**—The cities in the Rocky Mountain region owe their prosperity chiefly to the mines about or near which they have grown up. Only in a few instances (*e.g.*, Salt Lake City) have other resources caused their growth.

DENVER (107), the capital of Colorado, is the most important, being a railway center and having a large trade with the rich mining region round about. So much silver and gold are mined that a branch of the United States mint has been located here. Lead is also produced in large amounts, especially at **Leadville** (11). **Colorado Springs** (11) is the seat of Colorado College, and is an important health resort.

To the north, gold-mines are the principal cause of the growth of **Virginia City** in Montana, **Boise City** and **Salmon City** in Idaho, and of **Baker City** in Oregon. **Butte City** (11), Montana, and **Helena** (14), the capital, lie near rich copper and silver mines.

Santa Fe (7), the capital of New Mexico, is the oldest town in the United States. Much of the traffic with Mexico passes through here, the old Santa Fe trail having been one of the routes most used before the advent of railroads.

Near **Silver City**, New Mexico, are valuable mines of copper, and near **Tombstone**, Arizona Territory, rich deposits of silver are being worked.

Salt Lake City (45), the capital of Utah, situated in a fertile valley eleven miles from the Great Salt Lake, was for many years a place isolated from all others, and hence of necessity largely self-supporting. The carefully irrigated land produced abundant food, and the city now sends dried fruit, eggs, and butter to the mining regions. Woolen goods, boots and shoes are manufactured. The streets of the city are very wide (137 feet), and the blocks between, 600 feet long. Irrigating canals are conducted through the streets to all parts of the place. The great Temple of the Mormons rises high above all other buildings. **Ogden** (15) is an important railroad center, being the meeting-point of the Union and Central Pacific roads, and the terminus of several others.

Virginia City (9), Nevada, owes its prosperity to rich silver-mines. It contains nearly one-fifth the population of the state.

In the rich and fertile region west of the Cascade and Sierra Nevada Mountains and on the Pacific coast a number of large towns have grown up.

Sacramento (26), the capital of California, lies at the head of navigation of the Sacramento River, and is the meeting-point of several railroads. The Central Pacific road has its car-shops here.

There are also woolen and flour mills, beet-sugar factories, and iron foundries, and the produce of the surrounding agricultural sections is marketed here. The land on which the city stands has been artificially raised several feet above the swampy level of the early gold washings that first determined its location.

Stockton (14) is in the midst of a fine wheat section, which it serves as a center for collection and distribution. Besides railroads, the San Joaquin River, from which a navigable canal leads to the city, connects Stockton with San Francisco. The "keyhole breeze," which pours in through the Golden Gate, is put to use by the farmers round about in driving windmills, which pump the water used in irrigation.

San Jose (18), in the rich wine and fruit growing Santa Clara Valley, has also medicinal springs, and attracts many invalids. Artesian wells are here the source of most of the water-supply, as in other towns to the south.

Los Angeles (50), of which the full Spanish name was "la Pueblo de Nuestra Señora la Reyna de los Angeles" (the town of our lady the queen of the angels), is a place of great attractiveness on account of its mild and very equable climate. The country round about is the best wine and fruit section in the United States, large quantities of each product being sent yearly to the Eastern States and abroad. Much honey is also obtained, and wool is a leading shipment. The growth of Los Angeles has been very rapid, its population rising from 6000 in 1870 to 35,000 in 1885. Like other towns in southern California, it is frequented by invalids and winter residents. The city is becoming an important railway center, the neighboring ports of Wilmington and San Diego giving easy connection with Pacific steamship lines.

SAN FRANCISCO (299), the metropolis of the Pacific coast, is established in its superiority by its central position and unexcelled harbor.

The residence city, **Oakland** (49), on the east of the bay, is essentially one with San Francisco in its interests, as are also several other smaller towns.

As the converging point of the leading railroads of the west, San Francisco handles the products of a wide area—grain, wool, fruit, and wine from the fertile valleys, lumber and fish (mostly salmon) from the mountains and rivers to the north, furs from Alaska, and gold, silver, and quicksilver from the mines of the Sierras and the Coast Mountains. Tea, coffee, rice, silk, and sugar, the last mainly from the Sandwich Islands, are among the imports. Manufacturing is also carried on with a large variety of products.

The very irregular surface of the peninsula on which San Francisco is situated seemed at first so unfavorable for a city site that an attempt was made to build the metropolis farther within the bay. The advantages of position, however, prevailed, and the steep barren hills and shifting sand-heaps have been covered with buildings or included within parks. The Golden Gate Park, three miles long with half a mile of ocean frontage, is a striking example of what wealth and skill can accomplish. The houses of the city are largely of wood. In early days, when labor was scarce and dear, house-frames were brought in sections from the east by ships sailing around Cape Horn, and later, when stone was wanted, granite was brought from China for many structures.

The hills of the city have caused an extensive use of cable street-car lines, over fifty miles of such roads being in operation.

Originally a Spanish settlement, San Francisco rapidly became cosmopolitan when the discovery of gold drew miners from all countries, and the foreign element is still prominent.

The University of California is at **Berkeley**, near Oakland.

In Oregon, the fertile valley of the Willamette contains the greater part of the population. In it are **Salem**, the capital, and near the confluence of the Willamette and Columbia, **Portland** (46), the commercial and manufacturing center of the state.

Lumber, furniture, foundry products, and woolen goods, as well as a wide variety of other manufactures, are made in Portland, and besides these wheat, flour, and salmon form articles of commerce. **Eugene City** is the seat of the State University.

The shipping advantages of Puget Sound, and the wealth of minerals, forests, and soil of western Washington, are building up a number of towns.

Of these, **Seattle** (43), with the State University, and **Tacoma** (36) are the most important. They both handle much lumber, grain, coal, and fish. A line of steamers takes shipments from Tacoma to Alaska.

In eastern Washington is **Spokane Falls** (20), the chief milling town of the state, and possessing also large foundries. **Walla Walla** is the center of a rich wheat-growing valley.

Alaska.—Alaska occupies the north-west peninsula of North America, a strip along the coast southward to latitude 54° 40′, the neighboring coast islands, and the Aleutian Archipelago, with several islands to its north.

The most western extremity is the island Attoo, in longitude 173° E., which is farther west from San Francisco than that city is from Maine.

From Mount St. Elias southward the Coast Range or Sea Alps form the eastern boundary. On account of the great amount of snow that falls, they contain numerous (5000) glaciers. The Muir glacier unites nine large glaciers and seventeen lesser ones, and at the coast is over a mile wide.

Much ice is taken from the glaciers and carried to California and elsewhere.

The Aleutian Islands contain several active volcanoes, and others exist in the narrow mountainous Alaska Peninsula.

The large northern part of Alaska is a rough uneven plateau with no lofty mountains. The Yukon River has a volume much

greater than the Mississippi, and is navigable for about 1500 miles to Fort Selkirk.

The climate of Alaska is much milder than that of Labrador, but is extremely rainy, especially along the coast. Forests of heavy timber exist in the south-east, and at places in the interior.

Very little agriculture is possible, the summer being too short and cool. Potatoes and turnips do well, but grain does not ripen. The best section is the peninsula east of Cook's Inlet, where grazing might be profitably carried on and fair crops raised.

Furs are the chief source of revenue, the fox, marten, and beaver, the sea-otter and the fur seal abounding, the last mentioned being at present the chief object that makes Alaska valuable. The world's supply of sealskins is derived almost entirely from this source, the two Pribylov Islands, St. Paul, and St. George, being the only places of importance where fur-seal hunting is carried on. The coast waters abound in fish, cod being found in the east of Bering Sea and along the southern coast of the territory over a total area four times as great as the famous Newfoundland banks. Salmon are even more numerous than in the Columbia River region, while herring, and also whales and walruses, are caught in the neighboring waters. Coal exists in several places, and gold is found in paying quantities. Sulphur is obtained from the craters of volcanoes and in hot springs. Silver, copper, niter, and petroleum are found, and marble is quarried near Sitka. The population of Alaska numbers about 30,000, but includes fewer than 500 white persons. The greater number are Eskimo and Indians. But little is done in educational matters, schools, which were conducted by Russian priests, now in many cases lacking teachers.

The land was purchased from the Russian Government in 1867 for $7,200,000. It has yielded since then $50,000,000 in furs.

Sitka, the capital, formerly called New Archangel, is on Baranof Island, and has a population of about 2200.

St. Paul, on Kodiak Island, has a situation well adapted for controlling much of the commerce of the coast.

4. **MEXICO**, which extends from the Gulf of Mexico to the Pacific, and from 32° N. to 15° N., has a total area about one-fourth of that of the United States without Alaska. The larger

FIG. 29.—SITKA.

part of the country is elevated table-land, of which the northern portion forms a continuation of the arid and desert region of Arizona and New Mexico. The densest population is found to the south of the tropic of Cancer, and more particularly on a portion of the **plateau of Anahuac**, which lies at an elevation of 7500 feet above sea-level. Here, on an area about equal to that of New York and Pennsylvania, is settled two-fifths of the entire population of more than twelve million.

This elevated table-land, surrounded by mountains, many of which are the cones of active or extinct volcanoes, forms what is called the **cold region** of Mexico, and **temperate** and **warm regions**[1] are successively entered as one descends the outer slopes of the surrounding mountains to the belts of low flat land that border the coasts. On the table-land there is a marked contrast between a rainy season (in our summer months) and a dry season throughout the rest of the year; but in the lower levels, with their tropical heat, rain falls from time to time, even in the dry season. Among the lowlands the outlying thinly populated peninsula of **Yucatan** has a dry climate almost at all times. On the table-lands the **products**, in consequence of the elevation, are not unlike those of the South Atlantic states—corn (the principal food of the people), cotton, and even wheat and barley; but there is one product that has always formed a very marked feature of Mexican agriculture. This is the **agave** or American aloe, grown chiefly for its sap, which when fermented yields the favorite drink of the Mexican people, called **pulque**. In the lowlands are grown coffee and cacao, sugar, tobacco, and vanilla. On the table-land irrigation is necessary, and the Spanish settlers have constructed great aqueducts similar to those which have existed in Spain since Roman times. **Silver** is found in great abundance in many places, and forms the principal export, after which come "hemp" (from Yucatan), various woods, hides, coffee, and other lowland products, and India-rubber. The so-called hemp, more properly henequen, is a fibre derived from a species of agave, and is now largely used to make packing. The export is rapidly increasing in amount.

Railways are still few, but an important addition to the railway system has been made by the completion of the roads connecting

[1] Tierras frias, tierras templadas, and tierras calientes respectively.

Mexico with the United States at El Paso, Piedras Negras, and Laredo on the Rio Grande, and an important railway is now in progress across the Isthmus of Tehuantepec, where the Rocky Mountains become narrowed to a single chain little more than 4000 feet in height. Another road connects Vera Cruz and the capital; and through the rich silver-producing State of Sonora a line extends from the coast to the Southern Pacific in Arizona.

Among the **people** the dominant race consists of Europeans of Spanish origin (**Creoles**), but these are greatly outnumbered by

FIG. 36.—AN AGAVE PLANTATION—AN AQUEDUCT.
(By the kind permission of Mr. Coles, Curator of the Map Department, Royal Geographical Society.)

natives and mixed breeds (**Mestizoes**). Hundreds of years before the arrival of Europeans the plateau of Anahuac was the centre of powerful native empires—first, that of the **Toltecs**, then of the **Aztecs**—and monuments of both still remain scattered over Mexico and Central America. The empire of the Aztecs was overthrown by Cortez in 1521, and till the present century

Mexico remained a Spanish dependency, but ultimately the people, following the example of the British colonists in North America, threw off the yoke of the mother country, and founded a federal republic (1824).

The only towns with more than 100,000 inhabitants are **MEXICO** (330), on the Lake of Tezcuco, and **PUEBLA** (110). Three have more than 50,000, **Guadalajara** (95), **San Luis Potosi** (63), and **Guanajuato** (52), all situated, like Mexico, on the table-land. **Vera Cruz** (24), on the Gulf of Mexico, is the chief eastern seaport; **Acapulco** (3), and **Mazatlan** (16) the western ports. **Tehuantepec** (7) is growing in importance.

5. **CENTRAL AMERICA.**—The territory to the south of Mexico is chiefly divided among five small republics, **Guatemala, Salvador, Honduras, Nicaragua,** and **Costa Rica,** which have together an area of nearly one-fourth that of Mexico, and a population a little over a fourth of that of the larger neighbor.

The general character of the surface is similar to that of Mexico, but the elevation is on the whole lower. An important depression is the valley between the western mountains of Nicaragua and those of Costa Rica. In it lies the large fresh-water lake, Nicaragua, which discharges into the Caribbean Sea by the navigable San Juan River. This lake and river it is proposed to use as portions of an interoceanic canal, and an American company has been chartered, and has begun the necessary excavations. The elements of the population of Central America are also much the same as in Mexico. The **products** are those of the tropical parts of Mexico, **coffee** being the chief, though **indigo**, india-rubber, and various drugs, are of importance. Valuable **timber** and **dyewoods** are obtained from the forests, and **Belize,** in British Honduras, the only place with a good harbor on the Atlantic coast, is a great place of export for **mahogany. Guatemala** (70) is the largest town in Central America. The largest towns in the other Republics have from 20,000 to 30,000 inhabitants each.

6. **WEST INDIES,** a group of islands with a situation similar to that of the Eastern Archipelago, but differing from the latter in that they all lie to the north of the equator, and in having a much smaller aggregate area.

Their whole area is not far from twice that of New York State, or only about one-third of that of the island of Borneo. Their total population is about four millions, the two largest islands, Cuba and Hayti, being very thinly populated.

The group is divided into the **Greater Antilles** in the west, the **Lesser Antilles** in the east.

All the islands except the **Bahamas,** which are flat coral islands, are more or less mountainous. The mountains, and

higher parts of the islands generally, are covered with dense woods, to which palms and tree-ferns give the prevailing aspect, though mahogany, ebony, and other valuable timber trees are also numerous. In accordance with their tropical situation, they have a dry alternating with a rainy season. The former occurs during our winter months, when the trade-wind blows strongly over the group; the latter during our summer, when the trade-wind moves farther north in consequence of the higher position of the sun. During the month of September, when the sea is at its hottest, the winds are very variable, and **hurricanes**[1] are then most frequent.

The **chief food of the people** is derived from the fleshy underground parts of three different plants, **manioc**,[2] **yams**, and **sweet potatoes**,[3] and the **chief plantation crops** (grown for export) are **sugar**, **coffee**, and **tobacco**. Mineral products are of little importance, some iron being exported to the United States from Cuba, and the only important product from the animal kingdom is sponges,[4] obtained from the banks of the Bahamas.

The **population** is entirely descended from natives of other continents—Europe, Africa, and Asia. At the time of their discovery by Columbus[5] the West Indies were inhabited by a pretty dense population, principally gentle Arawaks and wild and warlike Caribs, but on most of the islands the natives were speedily exterminated through the barbarities of the invaders.[6] Hence a large proportion of the inhabitants are the descendants of negroes, originally slaves, but now all free. Indian and Chinese coolies[7] have been introduced as laborers since the liberation of the negroes, in consequence of the unwillingness of free negroes to work.

With the exception of Hayti, which is now divided between the **Republic of Hayti** in the west and that of **San Domingo** in the

[1] See Introd., p. 41. [2] See p. 174.

[3] A plant allied to the convolvulus, and totally different from what is now called the potato. It was this plant, however, that was first known as the potato, that name being a corruption of a word of unknown origin (*batatas*) designating the sweet potato.

[4] Sponges consist of a horny skeleton of a kind of animal, the living part of which consists of a slimy substance investing the skeleton.

[5] The first land reached by Columbus in the New World was one of the Bahamas, probably Watling Island.

[6] On the island of Porto Rico, no natives survived forty years after the advent of the Spaniards. [7] See p. 313.

east, all the islands now belong to European Powers; Spain still holding the largest area, Great Britain the next largest, while France, the Netherlands, and Denmark hold the remainder.

1. **To Spain belong**: (1) **Cuba**, noted for its tobacco as well as its sugar. Its most populous part is in the west, where there are several railways, and where on a fine bay on the north coast is situated the capital, **HAVANA** (200), the only large town in the whole archipelago. (2) **Porto Rico**, in which coffee is the product next in importance after sugar.

2. **To Great Britain belong**: (1) **Jamaica**, south of eastern Cuba, in which, besides **sugar** and **coffee, pimento**[1] is an important product; chief port, Kingston, on the south coast. (2) **The Bahamas**. (3) **The Leeward Islands**,[2] composed of all the British Islands between Porto Rico and Dominica, and including the latter. The principal products of the group are sugar, limes, tamarinds, and arrowroot. (4) **The Windward Islands**,[2] including all the islands, except Tobago, between Martinique and Trinidad; principal, **Grenada**. (5) **Barbados**, the most densely peopled of the West India Islands, where accordingly the negroes are obliged to work in order to gain a subsistence. (6) **Trinidad** and **Tobago**, opposite the delta of the Orinoco. Trinidad has a rich soil in the west, producing **sugar** and **cacao**, and remarkable for the possession of a large asphalt lake in the interior, from which nearly all the asphalt used in paving the streets of cities is obtained.

3. **To France** belong the islands of **Guadeloupe** and **Martinique**, besides some smaller islands.

4. **To the Netherlands** belong the three considerable islands of **Curaçao**, **Aruba**, and **Bonaire** or Buen Aire, along the north coast of Venezuela, besides two smaller islands and half of a third among those of the British Leeward group.

5. **To Denmark** belong Santa Cruz, St. Thomas, and one or two other islands among the Virgin group.

SOUTH AMERICA.

Approximate latitudes: Caraccas (Saigon), 10° N.; Quito (Stanley Falls, middle of Sumatra), 0°; Rio de Janeiro, 23° S.; Buenos Ayres (Adelaide), 35° S.

Approximate longitudes: Cape St. Roque, 35° W.; Punta Parinas (Key West), 82° W.

South America has an area about seven-eighths that of the continental part of North America, and is the fourth continent

[1] Also known as *Jamaica pepper* and *allspice*.

[2] This use of the terms Leeward and Windward Islands is confined to Britain, and is quite inappropriate to the facts of the case. There is better justification for other two uses of the names adopted elsewhere. Some geographers apply the name Windward Islands to the Lesser Antilles, as being directly exposed to the trade-winds; that of Leeward Islands to the Greater Antilles. By others, again, the latter name is applied to the islands along the north coast of Venezuela.

FIG. 31.—THE SIERRA OF SANTA MARTA, showing the three Vertical Zones of Vegetation

in order of size. It has its broadest part, in all four-fifths of its area, within the torrid zone. The **Andes** or **Cordilleras**, the longest chain of mountains in the world, traverses its whole length parallel to the west coast, with only a few breaches made by river valleys near its southern extremity. The southern part of this system is single, unless the mountains of the islands that here fringe the Chilian coast be considered as belonging to the Andes; but north of that fringe two chains can generally be made out more or less distinctly, and about the point where the coast begins to trend north-westwards the main chains diverge most widely and enclose a table-land varying from 11,000 to 16,000 feet in height, and about 400 miles in breadth.[1] The chains again converge towards the equator, a little to the north of which the system divides into three, enclosing elevated valleys which gradually slope towards the north, and are drained by two rivers, the **Magdalena** and **Cauca**, which unite before falling into the **Caribbean Sea**. The greater part of the system is highly volcanic, and the whole coast which they face is subject to earthquakes. The highest summit in the chain is believed to be **Aconcagua**, about 32° S., which attains an elevation of more than 22,000 feet.

A short range running parallel to the north coast east of the lower Magdalena takes the name of **Sierra Nevada** (or Snowy Sierra) **of Santa Marta**, from containing peaks clothed with perpetual snow, but it is the only range in South America not belonging to the Andes which reaches that limit. Two table-lands crowned with mountain ranges, whose general direction is also parallel to the nearest coast, occupy the north-east and the east, the first forming the highlands of Guiana and eastern Venezuela, the other those of Brazil. Between these highlands and the Andes stretch the great plains of South America, drained by the three great rivers, the **Orinoco**, the **Amazon**, and the **Paraguay** (of which the lower **Parana** forms a continuation).[2] These rivers are all magnificent navigable streams. The **Orinoco**, the upper half of which describes a somewhat semicircular course, is navigable for nearly 1000 miles; the Parana and Paraguay are navigable continuously to the interior of Brazil; and the Amazon is more important than either in this

[1] See section in diagram E., p. 63.

[2] See comparison of surface of North America and South America on p. 70.

respect, being navigable without interruption for 2600 miles from its mouth, while 6000 miles of navigation in all are afforded by the main stream and its tributaries. All the main tributaries of this river and of the Paraguay, including the upper part of the course of the Parana, have their navigation more or less interrupted by falls and cataracts.

The **climate** of South America is greatly affected by the chain of the Andes, the two sides of which present striking contrasts as regards rainfall and vegetation everywhere, except in the extreme north. In the north copious rains with a rich tropical vegetation occur on both sides; the eastern plains of this region, forming the **Llanos** of the Lower Orinoco, are flooded during the rainy season (our summer), and during the dry season, before they become quite parched, present to view chiefly vast expanses of grass, though they are no longer so treeless as they were described by Humboldt in the early part of the present century.

The contrast of climate begins about 4° S. Thence to about 30° S. the east (trade) winds, which blow from the Atlantic for the greater part of the year, deluge the eastern slopes of the Andes with rain, and cover them with dense forests as high as trees can reach. Dense tropical forests (**selvas**) likewise occupy the valley of the Amazon to its mouth. South of the Amazon, however, the Brazilian coast mountains deprive the Atlantic winds of much of their moisture, so that the table-lands and plains intervening between them and the Andes (the **campos** of Brazil and the northern part of the **Gran Chaco**) have only a scanty rainfall. On the west of the Andes, between the latitudes mentioned, no rain whatever falls except high up on the mountain sides, and moisture appears on the low grounds only in the form of mist (**garua**). Vegetation is consequently scanty except beside the rivers, and for six or seven degrees north of 28° S. the strip of coast is a desolate wilderness. South of latitude 30° S., the contrast is opposite to that just described. There the prevailing winds are from the north-west, and bring plenteous rains from equatorial seas to the western slopes of the Andes, and still farther south to the lowlands at their base; while on the eastern side, the plains (the treeless **Pampas** of the Argentine Confederation and the bleak steppes of Patagonia) get drier and drier as one goes southwards. In this southern part, the western slopes of the Andes are as densely clothed with forests as the eastern slopes farther north; but the abundance of moisture has the effect of suddenly depressing the snow-line, which is between 8000 and 9000 feet lower behind the island of Chiloe (about latitude 40°) than it is seven degrees farther north.[1]

The **animal world** of South America is surprisingly different from that of the rest of the globe, even from that of the neigh-

[1] See Introd., p. 53.

boring continent on the north—one proof among others that the two halves of the New World were separated from each other by water down to a comparatively recent geological period. Here and here alone are to be found great numbers of **monkeys, living entirely on trees** and provided with tails which can be used in grasping, **blood-sucking bats, sloths, armadillos, llamas**, and **alpacas**, a large number of gnawing animals like the rabbit (one of which, the **vizcacha**, burrows underground like the prairie-dog, and is as abundant in the plains of the south as the latter animal is in parts of North America), besides a greater variety of **parrots** and **humming-birds** that are found elsewhere. The latter birds are absolutely confined to the New World. The **rhea**, a peculiar kind of ostrich, is to be seen on the southern plains.

The **population** is still very scanty; according to the best estimate that can be formed, not more than 34,000,000, or three-eighths of that of North America. Four-tenths of the population are estimated to be native Indians, two-tenths whites, one-tenth negroes (chiefly in Brazil), and the remainder mixed races, so that on the whole the Indian element still largely predominates. The white population in Brazil is of Portuguese origin, but elsewhere, except in Guiana, chiefly of Spanish descent, almost the whole continent having been divided between Spain and Portugal early in the sixteenth century.

The enervating effect of the climate in the tropical portion of the continent has retarded the development of the immense resources of the land, notwithstanding the facilities presented by the navigable streams; and it is believed by some that Chinese labor alone can bring wealth and prosperity to these burning lands. In spite of the fact that the land has been so long in the hands of the Europeans, it is said that there are not in all South America at the present day 100 miles of what in Europe would be called roads. **Railways** are now of more importance, and there are in Peru two of the most remarkable railways in the world, 'the railways in the clouds' as they have been called, since they ascend to the plateaux between the chains of the Andes, one from Lima to Oroya attaining a height of 15,600 feet.

SOUTH AMERICAN STATES.

1. **BRAZIL**, on the east side of the continent, formerly an empire, but declared a republic under the name of the United States of Brazil after a revolution in November 1889. In size it

FIG. 32.—SCENE IN THE PAMPAS

In the foreground, on the left, vizcachas; on the right, rheas. In the middle distance, on the left, pampas deer

is the rival of the United States and Canada. (See table, p. 370.) The **population** is about 12,000,000, the great majority of whom are either negroes or partly of negro descent. Many of the negroes were slaves down to the year 1888, when slavery was abolished. The population is densest in the coast provinces south of the equator. The interior is chiefly occupied by wandering native tribes. In tropical Brazil are grown all kinds of tropical products, but the **great staples** are **manioc, coffee,**[1] **sugar,** and **cotton,** the three last for export.

The poisonous tubers of the manioc, when bruised and heated, yield tapioca, the principal food of large numbers of the people. **Cacao** and India-rubber[2] are important products of the north. Among the hills in the portion of Brazil outside of the tropics (only about one-fifteenth of the whole), numerous **German colonies** have been founded, and to these **Italian colonies** have more recently been added.

The principal towns of Brazil are on the coast. The capital is **RIO DE JANEIRO** (550), situated on one of the most beautiful landlocked bays in the world, forming an excellent harbor. South of the equator the portion of the coast of Brazil exposed to the south-east trade-wind is flat, surf-beaten, and in many places bordered by sand-dunes;[3] and **BAHIA** (200), or San Salvador, and **PERNAMBUCO** (130) are the only important seaports. The latter owes its origin to the protection afforded by a natural breakwater or reef, which gives it another name, **Recife** (reef). North of the equator, the coast, like the whole of the north-east coast of the continent, is bordered by shallow mud-flats, generally bearing mangroves.[4]

2. Colonial **GUIANA**[5] consists of three portions—one British, with capital, **Georgetown** (53), at the mouth of the Demerara; one Dutch, called **Surinam,** capital **Paramaribo** (29), and one French, called **Cayenne,** capital **Cayenne** (8). Surinam and Cayenne are together about equal to British Guiana in size, and all three to South Carolina, Georgia, and Florida.

They are all engaged in the production of sugar, coffee, rum, and molasses, besides which Cayenne produces spices, Surinam cotton, and British Guiana lumber. The laborers are negroes, mulattoes, and coolies.

3. **VENEZUELA,** a federal republic in the north of the continent, consisting chiefly of the basin of the Orinoco; population

[1] Half the coffee produced in the world, though not the best, is grown in Brazil.

[2] Obtained here chiefly from a tall tree allied to the manioc shrub, not from the twining plant from which it is obtained in Africa.

[3] See Introd., p. 25.

[4] See cut, p. 58.

[5] Part of Guiana belongs Brazil and Venezuela.

more than 2,000,000, the majority of whom are settled on a small area in the north-west beyond the basin of the Orinoco, along the north and north-western slopes of the branch of the Andes, which here runs north-eastwards through the territory.

People of Spanish, Indian, and negro descent, all now free, make up the population. The staple product is **coffee**; but cacao, cotton, tobacco, and sugar, besides other tropical products, are grown. Gold and copper are important minerals. The llanos of the Orinoco are devoted to cattle- and horse-rearing, but the number of the live-stock

FIG. 83.—SCENE IN HONDA, COLOMBIA. (By the kind permission of Messrs. Hachette.)

has greatly declined compared with what it once was. Capital, **Caraccas** (72); chief ports, **La Guayra** and **Porto Cabello.**

4. **COLOMBIA,** a federal republic in the north-west, extending as far south as the equator, with a population of more than 3,000,000, chiefly settled in the upper parts of the valleys of the Cauca and Magdalena, where in consequence of the high elevation the grains of temperate climates are grown.

BOGOTA (100), the capital, at the height of 8000 feet, has, though less than five degrees north of the equator, a very healthy climate, with a temperature like that of a perpetual spring. The **mineral wealth** is great, and gold and precious stones take a leading place among the exports,

which also include Peruvian bark,[1] coffee, cacao, &c. The great channel of communication is the Magdalena, which is navigable as high as **Honda**, between 500 and 600 miles from its mouth. As yet there are few railways, but one of these is of high importance, as forming the shortest connection between the shipping of the Atlantic and Pacific. The **Isthmus of Panama** belongs to Colombia, and here a depression in the mountains has allowed of the construction of a **railway** across the isthmus, at the height of 260 feet at the highest point, from **Colon**, or **Aspinwall**, on the Atlantic side, to **Panama**, on the Pacific side. Through the same unhealthy depression an attempt is now being made to pierce a **ship-canal**. **Cartagena** (16), on the Caribbean Sea, is the chief seaport.

5. ECUADOR,[2] a republic chiefly south of the equator, but which owes its name to the fact that its capital, Quito, is almost on that line. The population is little more than 1,000,000, nearly all settled on the plateau between the chains of the Andes.

Quito (80), situated at an elevation of between 9000 and 10,000 feet, has a temperature all the year round like that of our May. The only port is **Guayaquil** (40), whence cacao, grown on the western lowlands, is exported. To Ecuador belong the **Galápagos**, or Turtle Islands, a group situated on the equator, about 700 miles to the west.

6. PERU, a republic lying to the south of Ecuador, with a population of about 3,000,000, at least half of whom are pure Indians. It is composed of three zones—(1) a barren **coast-strip**, fertilised only here and there by rivers from the Andes, on the banks of which sugar-plantations are tended by Chinese coolies; (2) the **sierra**, or valleys and table-lands of the Andes; on one of the highest of the table-lands lies **Lake Titicaca**, the largest lake in South America, at the height of 12,600 feet above the sea; and (3) the **Montaña**, the region on the eastern slopes of the Andes, containing the head-waters of the Amazon, a region largely covered by impenetrable forests, of which the most valuable product is **Peruvian bark**. There are valuable **silver** mines and deposits of **guano**[3] and **nitrate of soda**.

The guano and nitrate of soda, which are both used for manure, are found on the coast-strip, the rainlessness of which (see p. 171) has allowed of the accumulation of these deposits. The silver mines belong to the Andes, the principal being at **Cerro de Pasco**, the highest town in the world—upwards of 14,000 feet above sea-level.

The capital is **LIMA** (103), an unhealthy city on the coast-strip, a few miles from its port, **Callao**.

[1] The bark of the cinchona tree, from which quinine, a valuable drug, is obtained.

[2] Spanish=Equator.

[3] Guano consists of the droppings of sea-birds.

Before its conquest by the Spaniards under Pizarro in 1532, the empire of Peru, now one of the worst governed republics of South America, was the center of the empire of the Incas, which extended over a large part of South America, and was in some respects even more remarkable than that of the Aztecs of Mexico. Under it the country was provided with fine roads, aqueducts, and irrigation works (some of which can be utilised at the present day); and the government, though highly despotic, regulating the whole life of the people, was yet a mild despotism, and one that ensured the well-being of its subjects. Remarkable architectural monuments of this empire still survive at **Cuzco** (20), the residence of the Incas, as well as round Lake Titicaca and elsewhere.

7. **BOLIVIA**, formerly called Upper Peru, takes its present name from Bolivar, the leader in the movement by which the Spanish states in South America threw off the yoke of the mother country. It is now entirely an inland state, occupying the broadest part of the table-land of the Andes, with a **montaña** to the east. The Bolivian montaña is drained by the **Madeira**,[1] the principal tributary of the Amazon on its right bank, but this tributary has its navigation interrupted by falls and rapids for about 200 miles between Bolivia and Brazil.

The silver mines of **Potosi** (23), which made Peru so valuable a possession to the Spaniards, belong to this state and are still productive, though they no longer yield such enormous quantities of the precious metal as they supplied in former times. The chief towns of the republic are **La Paz**, on the table-land of Lake Titicaca (part of which belongs to Bolivia), and **Sucre** (24), near the eastern borders of the Andes, at an elevation of 9000 feet.

8. **CHILE**, a republic possessing the whole of the coast strip south of Peru, together with the islands that fringe that coast, including part of Tierra del Fuego and all the land on both sides of the Straits of Magellan. The **Araucanians**, a warlike native tribe, which long maintained its independence, have now been subdued, and their territory incorporated with that of the republic. The northern portion of the country is part of the desert strip of South America, which owes all its value to its deposits of nitrate of soda. The middle portion (between about 33° and 38° S.) contains the bulk of the population, among whom whites predominate. The field products are **wheat** and fruits, chiefly apples, but also oranges, citrons, lemons, peaches, and prickly pears. The mountains yield metals, especially **copper**; the northern

[1] So called on account of the forests which it traverses. See p. 345, *n.* 3.

desert furnishes **guano** as well as **nitrate of soda**. All these products, except fruits, are exported, and also hides and wool. The population is about 2,500,000.

The capital is **SANTIAGO** (250), on a fertile plain. The chief port, **VALPARAISO** (150), built on a fine bay looking towards the north, is the leading commercial city on the west coast of the continent.

9. ARGENTINE REPUBLIC, a state occupying a territory of more than 1,000,000 square miles, with a population of about 4,000,000. Its territory consists of a vast plain sloping down to the Atlantic from the mountains in the west and north-west, and the provinces in which the population is most considerable and most rapidly increasing are chiefly those in the neighborhood of the estuary of La Plata and along the banks of the lower Parana. Each province has a separate government for local affairs.

In the pampas of the province of **Buenos Ayres**, south of that estuary, in **Cordoba** to the north-west, and in **Entre Rios**, 'between the rivers' Parana and Uruguay, the dominant industry of the whole Republic, the rearing of sheep and cattle, is chiefly carried on. In the production of **wool**, the Argentine Republic ranks next after Australia. Along with wool, dried flesh (charqui), hides, &c., are the principal exports. Vast herds of cattle and horses roaming over unfenced prairies are managed by mounted shepherds called **Gauchos**, expert in the use of the lasso. In the **province of Santa Fé**, on the right bank of the Parana, tillage is rapidly extending, through the foundation by immigrants of agricultural colonies, which have of late years raised the Republic to the rank of a **wheat-exporting** state.

That part of **Patagonia** which is included in the territory belonging to the Argentine Republic is mainly a stony desert, on which a few Indians (remarkable for their high stature) live by **hunting** the **rhea** and **guanaco** and by fishing.

The capital of the Republic is **BUENOS AYRES** (612), on the shallow, nearly tideless estuary of **La Plata**,[1] which has silted up so rapidly since the foundation of the city by Mendoza in 1535, that large vessels have to anchor several miles out, and recently a new port, **La Plata** (65), was founded nearer the mouth of the estuary. **Rosario** (124), **Cordova** (54), and **Tucuman** (24), the next most important cities, are connected with Buenos Ayres by railroads, and a railroad reaches across the continent to Valparaiso and Santiago.

10. URUGUAY, a republic lying north of the estuary of La

[1] Even at the mouth of the estuary to the south of Montevideo, the depth is nowhere greater than thirty-six feet. The rise of the tide is from four to six feet. Greater differences in the level of the water of the estuary are sometimes produced by winds—continued southerly winds causing a rise of eight feet above the ordinary level; continued northerly winds a fall of four feet.

FIG. 34.—PATAGONIANS HUNTING GUANACOS AND RHEAS.

Plata, in which the chief occupations of the people are the same as in the Argentine Confederation. The population is about 700,000. The wool of the Uruguay and the Argentine Republic, generally known as **River Plate wool**, is mainly exported to France, Germany, and Belgium, in Europe, and to the United States, very little indeed being used in Great Britain. The wool is fine in staple, but generally shorter than that of Australia, and being, in consequence of the nature of the grasses on which the sheep are pastured, mixed with seeds and other vegetable matter, requires to be treated with special machinery, such as is not generally used in the United Kingdom.

The capital is **MONTEVIDEO (238)**, which has the best accommodation for shipping on the La Plata, but is less favorably situated than Buenos Ayres for internal trade.

11. **PARAGUAY**, an inland republic lying mainly between the Paraguay and Parana rivers, with a very sparse population (about a quarter of a million), chiefly of native Indians.

Its chief product is the so-called **Paraguay tea**, or **mate**,[1] which is generally used in the southern parts of South America as a substitute for tea and coffee, and is also grown in the neighboring states to the south.

The islands of **Tierra del Fuego**, with a cold and dripping climate, are inhabited by a small number of natives, of whom the southernmost are in the lowest stage of barbarism, but those in the north are more advanced, and, aided by missionaries, have learned to practise grazing. The **Straits of Magellan**,[2] by which they are separated from the mainland, are stormy and washed by strong tides, and hence difficult of navigation, so that sailing vessels still prefer the equally stormy, but, for them, less dangerous, route round Cape Horn.

The **Falkland Islands**, situated to the east of the Straits of Magellan, belong to the British, and sustain considerable flocks of sheep.

[1] Derived from a bush allied to the holly.

[2] So called because discovered and first navigated by a Portuguese navigator named Magalhaens in the first voyage round the world (1519–21). Magellan is the Spanish form of the name, and has been generally adopted because at the time of the voyage this seaman was in Spanish service.

EUROPE.

Approximate latitudes: North of Norway, 71° N.; south of Spain (north of India), 36° N.
Approximate longitudes: Ural Mountains, 60° E.; west coast of Iberian Peninsula, 9½° W.; of Iceland, 24° W.

THE eastern boundary of Europe has always been a matter of dispute, for in the east this continent is united to Asia in such a manner as to form only a peninsula of the latter continent. Yet Europe has from the first been recognised as distinct, (1) because the earliest civilisation in Europe was in the south, where it is divided from Asia by seas, and (2) because Europe, as a whole the most densely populated of all the continents, has so much in common in the history of its inhabitants.

The area varies according to the boundary line adopted in the east. On the whole, the most convenient line to adopt is that of the Ural Mountains, the Ural River, the Caspian Sea, and in the south-east a line running east to west through what is called the **Manich Depression**, from being partly traversed by the Manich, a tributary of the Don. By the adoption of this boundary the whole of the Caucasus region is assigned to Asia.

Within the boundary indicated, the area is about three and three-quarter millions of square miles, somewhat larger than the United States inclusive of Alaska.

The coast-line is the longest relatively to area of any continent, and the advantage of this to shipping is increased by the fact that the length of coast-line is due not merely to a large number of small indentations, but to its running out and in in such a manner as to form large inland seas and gulfs with peninsulas between. The interior is thus brought nearer to the sea, and in fact no part of Europe is as much as 1,000 miles distant from the coast.

All the seas and gulfs in the north are shallow, while all those in the south, except the Sea of Azof, are deep.

If the level of the whole continent with the surrounding seas were raised 600 feet, which is not much more than the height of the highest buildings above the ground, the White Sea, the North Sea or German Ocean, the Baltic with its branches, would all be converted into dry land with the exception of a few small basins, and at the same time the west coast of Europe would be extended so as to run from the west of Norway round the Shetland Islands, the Hebrides, and the west of Ireland, and then back to the south-east corner of the Bay of Biscay. Deep seas would, however, still remain along the south of Europe, although the greater part of the Adriatic, between Italy and the Balkan Peninsula, would be added to the mainland. Sicily would be united to Italy, Corsica to Sardinia, and Majorca to Minorca.

Beyond the line that would then form the west coast of Europe the depth of the ocean increases rather suddenly, so that that line may be held to mark the permanent boundary of the continent, and all the seas within it belong to the variable belt[1] which in some ages is dry land, in others water. All the islands within this belt are hence European islands; but the **Faroe Islands** and even **Iceland** are also considered European, because they have long been held by European powers, and because their climate resembles that of Europe more than that of the adjacent parts of America.

Europe has three great inland seas: **the Baltic, the Mediterranean, and the Black Sea.** They are called inland because they communicate with the ocean or with other seas only by narrow straits or channels. The Baltic communicates by means of the **Kattegat,** between Denmark and the south-west of Sweden, with the **Skager Rak,** a branch of the German Ocean; the Mediterranean with the Atlantic Ocean by means of the **Strait of Gibraltar** (less than nine miles wide); and the Black Sea, by means of the **Bosporus,** with the Sea of Marmora, which itself communicates by the **Dardanelles** with a branch of the Mediterranean.

The Mediterranean and the Baltic contrast with one another in several respects besides depth. The Baltic lies in a region where rains are plentiful and evaporation slight, and where accordingly numerous rivers convey abundance of fresh water to the sea, but little is returned to the air; the Mediterranean in a region where rains are scanty and rivers few, but evaporation brisk. The Baltic thus has its water made very fresh (in some parts less than one-fourth as salt as that of the ocean), the Mediterranean, on the contrary, salter than that of the ocean. The former tends to have its level raised by the fresh water poured into it, the latter to have its level lowered by the rate at which fresh water is drawn up from it as vapour by the power of the sun. Hence the Baltic is constantly overflowing—that is, a current is constantly running outwards from it into the German Ocean; the Mediterranean, on the

[1] See Introd. p. 25.

other hand, is constantly receiving an overflow from the Atlantic. A current flows inwards at the Strait of Gibraltar, and, advancing along the north coast of Africa, is often a great hindrance to sailing vessels.

Tides are scarcely felt in either sea. The currents at the mouth prevent them from sharing in those of the ocean, and they are too small to have great tides of their own.[1]

With respect to the **surface**, the mainland of Europe may be divided into **three regions**. (1) In the north there is a highland or mountainous region occupying the peninsula of Scandinavia. (2) Another mountainous region occupies the greater part of the south, reaching farthest north about the middle, where its boundary advances in Central Germany nearly to the latitude of London, receding thence south-westwards through the middle of France to the Pyrenees, and south-eastwards to the mouth of the Danube. (3) Between these two mountainous areas in the north and south there is a vast plain which stretches continuously from the shores of the English Channel and the German Ocean to the east of Europe, and in Russia spreads out north and south from the shores of the Arctic Ocean to those of the Black Sea.

The principal mountain systems are those of the **Alps**, the **Pyrenees**, the **Carpathians**, and the **Ural Mountains**.

From the smaller size of the continent and the way in which the surface is broken up and the outline indented, it follows that there can be no such large **rivers** in Europe as in Asia, Africa, and America. The largest are the **Volga** and **Danube**; the Volga in the great European plain, the Danube in the depression between the Alps and the Carpathians.

Though wanting in large rivers, Europe has three advantages in its river system. (1) The **rivers**, though short, are very **numerous**, and are **almost all navigable** for a longer or shorter distance, so that they serve to bring a great number of points on the coast into communication with the interior. (2) **The chief rivers radiate from common centres**, and thus bring the same inland regions into communication with far distant coasts. Two important centres should be remembered: (a) The **Alps**, whence flow the Rhine to the German Ocean; the **Rhone**, **Po**, and **Adige**, to the Mediterranean; and several tributaries of the **Danube** to the Black Sea. (b) The region in the heart of Russia, of which the **Valdai Hills** are the centre, the region from which flow the **Volga** to the Caspian Sea, the **Don** and **Dnieper** to the Black Sea, the **Western Dwina** and **Niemen** to the Baltic, and a tributary of the **Northern Dwina** to the White Sea. (3) The chief rivers, and hence different seas,

[1] See Introd. p. 45.

have been very easily brought into communication by means of canals. The Caspian is thus brought into communication with the Baltic,[1] the Black Sea with the Baltic and German Ocean, the Mediterranean with the German Ocean and the Atlantic.[2] The highest part of the connecting canals is generally under 600 feet, and in no case more than 1,400 feet above sea level.

The principal lakes are in two great groups. One group lies round the Baltic, and includes large lakes in Russia (**Ladoga**, the largest in Europe, **Onega**, and **Peipus**), and in Sweden (**Wener**, **Wetter**, and **Mälar**), and a large number of small ones in Russian Finland and North Germany. The other group is situated north and south of the Alps,[3] chiefly in Switzerland and Italy, the largest in this group being only about one-third of the size of the smallest of those mentioned as belonging to the former group.

The continuous series of mountains along the north of the **Mediterranean peninsulas** has a very important effect on the **climate and vegetation** of this region, which is thus very distinctly marked off from all the rest of Europe. The mountains serve to ward off the cold winds from the north and north-east,[4] and hence the temperature here is remarkably equable all the year round. The effect of the mountains is very clearly brought out in comparing places lying to the east of the limit to which they extend with others lying under their shelter. Constantinople lies beyond that limit, and the temperature of January there is ten degrees lower than in Naples, which lies in nearly the same latitude. The broad and deep Mediterranean assists in mitigating the extremes of temperature (see p. 50).

The Mediterranean region also differs from the rest of Europe in its **rainfall**. The summers here are the driest part of the year, and in the extreme south they are almost without rain. Hence the rivers, and especially those of the south, are poorly supplied with water in summer, and many of them in that season dry up altogether. For navigation they are of little use, but, on the other hand, much needed for irrigation.

This dearth of rain and the high temperature necessarily have a great influence on the **vegetation** and occupations of the people. In the first place, pastures fit for the rearing of cattle are few and far between. Dairy produce, and in particular butter, is consequently scanty. The place of butter is, however, taken

[1] See p. 249. [2] See p. 213. [3] See pp. 237, 269. [4] See p. 52.

by the fruit of a tree, the **olive**, which is in every way characteristic of the Mediterranean. It is a tree peculiarly fitted by its thick leathery leaves to stand the long summer droughts, and trees and shrubs of this kind form a large proportion of the forests and plantations of the whole region, except on the moister mountain slopes. Besides the olive, **southern fruits** are the characteristic products of the Mediterranean peninsulas, these including all the members of the orange tribe (oranges, citrons, lemons, &c.), all grown on trees similar to the olive, figs, pomegranates, grapes, almonds, pistachios, and chestnuts. **Agaves**,[1] or American aloes, and **cactuses**, both fleshy plants, though introduced only after the discovery of America, have run wild everywhere, and often form the hedges round gardens.

FIG. 35.—THE OPUNTIA CACTUS, OR PRICKLY PEAR.

North of the Mediterranean region, Europe is far from having a uniform climate, but the changes are more gradual; and what is most striking is the fact that these are greater from west to east than from north to south. In this part of Europe, in consequence of the influence of the Gulf Stream,[2] we see more markedly than anywhere else in the world the characteristics of the west coast climate of the northern hemisphere—cool summers, mild winters, and plentiful rains. To the east the winters become colder, the summers warmer, the rains on the whole scantier. Hence it is that while the seas on the coasts of Norway are never frozen, even within the Arctic circle, and icebergs are always kept far away from the Atlantic shores,[3] the rivers in the south of Russia (in the latitude of the middle of France) have their navigation stopped by ice for a shorter or longer period every year. The difference between east and west is even more striking when we compare the two sides of the Scandinavian

[1] See cut, p. 165. [2] See Introd. pp. 47, 51. [3] See Introd. p. 56.

peninsula.[1] The Gulf of Bothnia is frozen right across every year, so that it can be crossed by sledges; even the harbour of Christiania, at the head of the Skager Rak, is regularly closed for three or four months, and the drift ice in the Baltic is a serious hindrance to navigation till late in the spring. It must be remembered, however, that in these inland seas not only the greater cold (due to the high lands intervening between them and the Atlantic), but also the greater freshness of the water, is favourable to freezing.[2]

The influence of the west coast climate on the growth of cultivated plants is very conspicuous. While barley can be grown in Norway as high as 70° N., the limit of its cultivation descends even on the Gulf of Bothnia to 65° N.; apples, pears, and cherries can be grown even round Throndhjem (63° N.) in Norway, but in Russia only as far north as Moscow and Kazan, in lat. 56° N. (the same as Edinburgh). Still more instructive is the northern limit of the vine, which first ascends from the west coast and then descends in the east, beginning in the west near the mouth of the Loire in 47½° N., passing by way of Paris north-eastwards to about latitude 52° in the east of the kingdom of Prussia, and then descending south-eastwards through the south of Russia to the north of the Sea of Azof and Astrakhan (about 47° N.) In the west the limit is fixed by the insufficiency of the heat of summer, in the east by the excess of cold in winter.

The easterly decrease in the amount of rainfall is less marked than the increase in the extremes of heat and cold; for the increasing cold of winter favours condensation, the increasing heat of summer favours evaporation.[3] Hence there is a more striking contrast between east and west in the period when most rain falls. In the west the rainiest season is autumn; in the east, summer. The driest parts of Europe are in the extreme south-east of Russia, where agriculture is in consequence impossible.

Regarded as a whole with reference to its productions, Europe is remarkable for the amount of manufactured goods which it produces and exports to other continents. This pre-eminence it owes to three causes: (1) that here the inventions by which the great manufactures are carried on had their origin; (2) that here there is a remarkable abundance of coal and iron in situations near the sea, and hence favourable to transmarine commerce; and (3) that the varied outline, so advantageous for commerce, enables Europe easily to procure supplies of the raw material used in manufactures from other parts of the world, and to send away the manufactured goods.

[1] See Introd. p. 52 (3) (a). [2] See Introd. p. 57. [3] See Introd. pp. 49–50.

The production of cereals in Europe is still, however, between two and three times as great as that of North America. The **principal cereals** are **wheat** and **rye**, the latter being the chief crop in Germany, Scandinavia, and Russia. **Oats** form the principal crop in the north-west, and **maize** in regions which have warm and sufficiently rainy summers. Where the summers are almost rainless wheat will ripen, but maize not, unless the land be irrigated.

Large wild **animals** are now found in Europe only in the more thinly peopled regions. The lion, anciently met with in the Balkan Peninsula, is now extirpated from the continent. **Bears** and **wolves** are now seldom to be seen except in the forests of the east. The **chamois** of the Alps, Pyrenees, and Carpathians is becoming rare, and the **ibex**, another mountain goat, is nearly exterminated. In the far north the **reindeer** occurs both wild and domesticated. Among the domestic animals of the southern peninsulas, **mules** and fine breeds of **asses** to a large extent replace the horses of more northerly countries. Of the **food-fishes**, **cod**, **herring**, and **salmon** are the most important in the northern seas; **tunnies**, **sardines**, and **anchovies** in the Mediterranean; and the **sturgeon** is the most valuable in the rivers of the east.

The **population** of Europe is now over 350 millions, and it is rapidly increasing. Its density is about ninety to the square mile, and hence much greater than that of any other continent.[1]

The regions in which the population is densest are England and the south of Scotland, Belgium and the Netherlands, Saxony, various parts of the Rhine basin, and northern Italy, in all of which the density exceeds 800 to the square mile.[2]

The rapid increase of population in Europe, together with the desire to make use of the advantages of European civilisation to develop the natural wealth of the thinly peopled continent of America and other parts of the world, has led to a constant stream of emigration, which has flowed without interruption since the discovery of America, but in this century more rapidly than ever. At first these emigrants were chiefly Spaniards and Portuguese, now they are mostly of Teutonic race (English, Germans, Scandinavians), besides Irish. Next after these come Italians, who are the chief emigrants to the South American republics. The total population of European descent outside of Europe is now estimated at seventy millions.

The immense majority of the people speak **languages** which are allied to one another, and are hence inferred to be all modi-

[1] See table, p. 62. [2] See table, p. 870.

fied forms of the same language (now long extinct). The people speaking these languages may also be presumed to be mainly (though not wholly) of the same descent. These allied languages are called **Aryan**, and the people speaking them are said to be of the Aryan stock. The original home of the Aryan peoples is believed to have been somewhere in Asia, and Europe seems to have been occupied by successive bands of Aryans, each of which had a language differing more or less from that of the others. Hence **the Aryan languages are divided into families** or smaller groups, three of which are now spoken by about 800 millions of the inhabitants of the continent. These three great European families of Aryan languages[1] are (1) **the Teutonic**, in Germany, Scandinavia, Denmark, the Netherlands (including part of Belgium), and the British Isles; (2) **the Romance**, in certain countries where Roman influence formerly prevailed (Italy, the Iberian Peninsula, France, and part of Belgium, Roumania, &c.); (3) **the Slavonic**, in the east and south-east.

Less important Aryan families in Europe are the Keltic, now confined to certain isolated districts in the British Isles and France; the Hellenic, in part of the Balkan Peninsula and in the Grecian Archipelago; and the Lithuanian, in part of Russia.

Among **non-Aryan** peoples, the most important are those speaking the languages known as **Finno-Tatar**, including those of the Finns and Lapps in the north, the Magyars in Hungary, the Turks, and many tribes in Russia. A small but very interesting race is that of the **Basques**, on both sides of the Western Pyrenees, that race being a remnant of very ancient inhabitants of Europe, and speaking a language quite peculiar.

As regards **religion**, the bulk of the inhabitants of Europe profess different forms of **Christianity**. About half of these are Roman Catholics (chiefly in southern Europe), and the remainder are nearly equally divided between Protestants (chiefly in the Teutonic part of the continent) and adherents of the Greek Church (in Russia and the Balkan Peninsula). **Mohammedanism** is the religion of the Turks and some other inhabitants of Eastern Europe, and there are between five and six million **Jews** scattered through the different countries (chiefly in the East).

[1] See also Asia, p. 290

THE BRITISH ISLES.

Approximate latitudes: (Winnipeg), Lizard Point, the southernmost point of England, (Prague) 50° N.; South of Shetland Islands, (St. Petersburg), 60° N.

Approximate longitudes: 11° W. to 2° E.

THE British Isles are made up of the two large islands of **Great Britain** and **Ireland**, together with numerous small islands lying near. Great Britain, the larger of the two, consists of **England** in the south, **Scotland** in the north, and **Wales** in the west of the island. Being now under one government, they are frequently known by the name of **The United Kingdom**, when they are spoken of as one.

These islands lie to the west of the mainland of Europe, and are surrounded by the shallow seas which have already been mentioned (p. 182) as extending for some distance beyond the west of Ireland. Their relation to the continent of Europe is thus similar to that which Newfoundland bears to North America. The **North Sea** or **German Ocean** is at its widest part about 400 miles in width, or about one and a half times as broad as the wider parts of the Gulf of St. Lawrence, but at the narrowest part the seas severing England from the continent are only about one-third as wide as Cabot Strait, though wider than Belle Isle. These narrow seas between England and the continent form the **Strait of Dover**, which separates the opposing chalk cliffs of England and France and forms the communication between the **English Channel** and the North Sea. The **Irish Sea**, which separates Ireland from the north of England, is narrower but somewhat deeper than the North Sea, though it also is of only trifling depth compared with the ocean.

The total area of the British Isles, large and small, is rather more than 120,000 square miles, or about the same as that of the

New England States with New York and New Jersey, that of Great Britain with its adjacent islands about 90,000 square miles, or a little less than New York and Pennsylvania.

The character of the surface, which differs considerably in the two chief islands belonging to the group, is described in the separate sections devoted to Great Britain and Ireland, but with regard to the **coast-line** it is specially worthy of note that in both islands this is remarkable for its irregularity, and for the numerous bays, estuaries, and other inlets affording excellent accommodation for shipping.

In the case of Great Britain in particular it is likewise worthy of note that the coast-line runs inland at several points nearly opposite to each other in such a manner as to bring important seaports on opposite coasts within a comparatively short distance. Bristol and London are thus brought within little more than 100 miles of each other in a direct line, Liverpool and Hull are separated by about the same distance, and Glasgow and the nearest seaport on the Firth of Forth by only about twenty-five miles.

The **climate** of the British Isles is peculiarly favoured by the warm currents and warm winds from the south-west which prevail in this part of the world (see pp. 41, 50, 185), and answer to the currents and winds that influence the climate of the north-west of North America. It is to these influences that Great Britain and Ireland, though lying in latitudes in which in eastern North America cold and fog prevent almost all kinds of cultivation, enjoy a climate as mild as that of New York and Pennsylvania, and much more equable. In the south-east of England, which is the region containing the greatest extent of land fit for cultivation, the **crops** grown are much the same as in New York. Wheat is there the crop most widely grown, but certain districts in England (especially in the county of Kent, in the extreme south-east) are noted, like western and central New York, for their hops and their orchard-fruits. In Wales and the West of England, in Scotland and in Ireland, the climate is in general too cold or too moist for wheat, and oats are there the principal grain-crop. Agriculture in general is highly advanced in Great Britain, where on an average a greater number of bushels of wheat is grown to the acre than in any other country.

The **products** for which the United Kingdom is most noted, however, are not those of its soil, but those of its **mines** and

factories. As a manufacturing country it takes the lead among all the countries of the world, and this position it owes in a great measure to its wealth in the useful minerals **coal** and **iron**, and the ease with which they can be worked. The extent of the British coal-fields is about equal to that of the coal-fields of Pennsylvania, but it is greater than that of the coal-fields of any other European country except Russia, and the quality of the coal is excellent. Moreover, the coal is found everywhere in a convenient situation, in low grounds and near the sea. From the form of the country it follows as a necessity that the coal-fields could not at any part be very far from the coast, but more than one of the richest of the British coal-fields lies in a most accessible situation close beside a great seaport, so that the produce of the mines can be sent to other parts of the country in the cheapest manner possible. With the same cheapness, too, raw materials for manufacture can be brought from a distance to the factories established on or near the coal-fields and the products of manufacture sent away.

The advantage of this wealth in conveniently situated coal is more than doubled by the extent of the deposits of **iron ore**, and by the fact that some of these deposits are found in the very districts in which coal can be obtained to smelt the ore, and others close beside great seaports, even though they do not lie in coal-yielding districts.

In consequence of this great development of manufacturing industry the chief exports of the United Kingdom are manufactured articles, the chief imports articles used as food which cannot be produced in sufficient quantity at home for the large manufacturing population, and next to these the raw materials of manufacture. Of the **exports** by far the most important are **cotton manufactures**, and the next in importance **articles made of iron and steel**. Of cotton cloth there is exported every year considerably more than 100 yards for every inhabitant of the United Kingdom, equal to about three yards for every inhabitant of the globe, according to the best estimates of the population. The **principal imports** are **grain**, and above all wheat and flour, **raw cotton**, and **wool**, the two former derived mainly from America. Live animals and dead meat, dairy produce, all kinds of fruit, sugar and tea, are also largely

imported. Cattle and dairy produce are likewise sent in great quantity to Great Britain from Ireland. As the latter island possesses none of the richer coalfields or iron-ore deposits of the United Kingdom, it does not share to any great extent in the manufacturing industry of the country. Only one branch of manufactures flourishes there in a high degree—namely, that of linen, which at the present day is mainly pursued in the north-east of Ireland, where coal and iron are procured through the port of Belfast.

Historically the importance of coal and iron to Great Britain is shown by the fact that it is only since last century, when coal came to be used in the production of iron, and machinery for carrying on manufactures was invented, that this country attained the lead in manufacturing industries which it still possesses. Formerly wood or charcoal was used in the smelting of iron, and many a forest in England was laid waste in supplying fuel for this purpose. As late as the early part of last century Germany, which was, as it still is, richer in forests than England, was ahead of England in the production of iron, and it was only after coal began to be used in smelting iron, shortly before the middle of the same century, that this was changed. Near the close of the century again the great inventions of machinery (all made in England) greatly increased the use of iron and afterwards of coal, and at a later date the introduction of steam railways multiplied the use of these minerals still further. The invention of locomotives driven by steam was also of English origin (first applied in 1825), and for the rapid extension of railways Great Britain had the important advantage that from its form comparatively short railways could bring the heart of the country into communication with many great seaports.

The extent of the foreign commerce of the United Kingdom is due not merely to the nature of the industries pursued there. The islands which make up that country besides having, as already shown (p. 190), a coast-line highly favourable to shipping, have another great advantage for foreign commerce, in the fact that they lie nearly in the middle of the land surface of the earth. This helps to explain why such articles as wool, raw cotton, coffee, tea, &c., are brought to this country in large quantity only to be sent away again to those in which they are consumed or used. One-fifth of the whole value of British exports is the value of articles that have first been imported from abroad, and have undergone no change in this country before being re-exported.

The advantage of this geographical situation is likewise shown his-

torically. Before the discoveries of the fifteenth and sixteenth centuries Great Britain was on the outskirts of the then known world instead of in its centre, and the commerce of the country has rapidly increased as the lands then and afterwards discovered have become more and more thickly peopled.[1] It is only since about the middle of last century that the foreign commerce of the British Isles has been the largest in the world. About one-fourth of the entire marine commerce of the country is carried on with the British colonies and dependencies, and more than two-fifths of that commerce is with these and the great English-speaking nation of the United States.

The **shipping** of the United Kingdom is even more extensive than its commerce, for multitudes of British ships are employed in carrying merchandise from one foreign port to another. The total tonnage of British vessels is at least eight times as great as that of any other European country, and not far short of twice as great as that of the whole shipping of the United States, including river boats and steamers.

The total **population** of the British Isles at the census of 1891 was upwards of 37 millions, which gives a density of about 311 to the square mile.

Of that total about 29 millions, or about three-fourths, belonged to England and Wales, 3¾ millions to Scotland, and a little more than five millions to Ireland. Since the census of 1841 there has been a constant decline in the population of Ireland in consequence of the rapid migration of the inhabitants to Great Britain and emigration to countries beyond the Atlantic. The Irish element makes up, in fact, by far the largest number of the hundreds of thousands of emigrants who leave the United Kingdom every year.

The **government** of the British Isles is called a **limited monarchy**. The head of the state is a king or queen, whose dignity is hereditary; but the power of the king or queen is limited by the fact that all laws are passed by a body called a Parliament, while they are carried out by ministers responsible to Parliament.

The Parliament, which has been adopted as the model for the legislative assemblies of many of the British colonies and even to some extent those of foreign countries, consists of two Houses, one, the **House of Peers**, composed mainly of hereditary members; the other, the **House of Commons**, composed of elected members. The members of the latter house are returned partly by old divisions of the country called 'counties'[2] (or subdivisions of counties), partly by towns which are known as 'parliamentary boroughs.'

[1] Comp. Italy, p. 271, and Germany, p. 228 (under Augsburg and Ulm).

[2] A name adopted for internal divisions in many of the British Colonies and in the United States, except in Louisiana, where *parishes* takes its place.

Education under State supervision was till recently in a backward condition in all parts of the kingdom, but it is now compulsory throughout Great Britain, though not yet in Ireland. For the higher education there are eleven **universities**, the most famous of which are, in England, those of Oxford and Cambridge, two very ancient seats of learning; in Scotland, those of Edinburgh and Glasgow; and in Ireland that of Dublin.

The majority of the people in Great Britain are **Protestants**, in Ireland **Roman Catholics**, and most of the Roman Catholics both in England and Scotland are of Irish origin.

The **British Empire** is composed of the British Isles and a large number of colonies and dependencies scattered over the globe. The following table contains the names of the principal parts of the British Empire, with other particulars regarding them:—

Name	Area in thousands of square miles	Ratio to Great Britain or Victoria	Population in millions, 1891	Date of acquisition
British Isles	122	1½	37·8	—
British India—				
Under direct British rule	1,068[1]	12½	220	1625–1856
Native States	731	8	64	—
Ceylon	25	3/10	3	1796
Cape Colony and its Dependencies	233	2½	1·5	1806–84
Natal	21	¼	0·5	1843
Basuto Land	10	⅛	0·2	1871
Bechuana Land[2]	43	½	0·07	1885
Protectorates in Africa	2,120	24	35	1888–91
Dominion of Canada	3,470	39	4·8	1623–1760
Newfoundland	43	½	0·18	1583
West Indies and Bermudas	13	⅛	1·3	1605–1803
British Honduras	7½	1/12	0·03	1670
British Guiana	109	1¼	0·28	1803
Australia	3,000	33	3	1787
New Zealand	104	1⅛	0·6	1841
Tasmania	26	3/10	0·14	1803

[1] Including Upper Burma, which was annexed on January 1, 1886. There are great differences even in the official or semi-official statements of the area and population of British India and the Native States respectively, the chief cause of which is that certain Native States, being directly superintended by British administrators, are sometimes assigned to British India, sometimes to the Native States. [2] Partly a Crown colony, partly a protectorate.

Among the minor possessions of the British Crown or territories now occupied by the British are: **in Europe**, the islands of Malta and Gozo, and the rock of Gibraltar; **in Asia**, the Straits Settlements on the Malay Peninsula, Hong-kong in China, Aden in the south-west of Arabia, Socotra and some smaller islands off the coast of Arabia, Labuan off the north-west of Borneo, Cyprus (under British administration since 1878); **in Africa**, various districts on the west coast (see p. 280), besides Mauritius and other islands (see p. 287); **in America**, the Falkland Islands, including South Georgia; **in Australasia and Polynesia**, a portion of New Guinea (see p. 116), the Fiji Islands, and various other small islands. The whole of the territory on the Lower Niger and Lower Benue (from about 12½° E.) in Africa has likewise been declared under British protection, and a portion of North Borneo belongs to a British Company. The total area of the British Empire, the largest in the world, is about 11½ millions of square miles, and the population upwards of 378 millions.

GREAT BRITAIN.

GREAT BRITAIN consists mainly of one large island nearly twice the size of Newfoundland, but includes also a large number of smaller islands in the adjacent seas. It is divided on historical grounds into the two ancient kingdoms of **England** and **Scotland** and the so-called principality of **Wales.**[1] The last-mentioned region consists of a hilly and even mountainous tract of country in the west, between the Bristol Channel and the estuary of the Dee, and owes its separate name to the fact that here the ancient British or Keltic inhabitants of the country remained longest unsubdued by the Germanic races (Angles, Saxons, and other tribes) who founded the kingdom of England. The people were finally conquered by the English about seven hundred years ago, and their country was completely united to England, but many of the inhabitants still speak a Keltic dialect known as Welsh. Since the conquest the eldest son of the king or queen of England has always borne the title of Prince of Wales.

England with Wales makes up two-thirds of Great Britain. The remainder belongs to Scotland, which was a separate kingdom until in 1603 the king of Scotland succeeded by descent to the crown of England. Even then the union of the two countries

[1] *Wales* and *Welsh* are not names originally used by the people of Wales. *Welsh* is the name applied by those who speak a Germanic language to those who do not, and properly means simply *foreign*.

consisted only in their having the same sovereign. Their parliaments remained separate for more than a hundred years later, and even yet Scotland has its own law with its own courts to administer the law, and its own church.

The boundary between England and Scotland on the mainland is a line stretching from near the mouth of the Tweed, along the crest of the range of grassy hills called the **Cheviot Hills**, to the lowlands at the head of the estuary of the Solway, where the surface was formerly occupied by morasses.

Such hills and morasses formed in remote times a natural boundary between two countries, the chief part of whose population has always been settled at some distance from this boundary. In Scotland the bulk of the inhabitants have always occupied the lowland area extending between the great estuaries of the Forth and Clyde and stretching to the north-east and south-west of these estuaries. In England again the nearest districts with a tolerably dense population are the fertile valleys of the Eden and the Tyne, that of the Eden in the west with Carlisle in its centre, that of the Tyne in the east. Hence it is not surprising that in former days, when communications were bad, a separate kingdom should have had its centre in the northern lowlands.

It is to Scotland that by far the greater number of the small islands of Great Britain belong, these lying chiefly on the west. Many of these are separated only by narrow channels, here called 'sounds,'[1] from the mainland, and these are known as the **Inner Hebrides**. Among these is the small island of Staffa, noted for its caves, of which the most remarkable is **Fingal's Cave**, with its flat-sided basaltic columns. Further out lies a long string of islands called the **Outer Hebrides**, a group in which the surface is mainly low, the soil boggy and unfruitful, the climate damp and foggy, and in which accordingly the scanty population depends largely on fishing. To the north of Scotland beyond the stormy channel known as the **Pentland Firth** are situated the **Orkney** and **Shetland Islands**, in which also fishing is one of the mainstays of the people.

To the southern part of Great Britain there belong only three smaller islands of importance. One of these is the **Isle of Wight**, which is separated from the south coast of England only by two narrow channels, an island noted for its quiet beauty and its mild climate. Another, the Isle of Anglesey,[2] forms one of the counties of Wales, from the mainland of which it is divided by the **Menai Strait**, which is narrow enough to be crossed by two bridges. The third is the **Isle of Man**, which lies in the Irish Sea, almost equally distant from England, Scotland, and Ireland.

[1] A Scandinavian name, Scandinavians having made many settlements in these parts of Scotland.

[2] Also a Scandinavian name, meaning *Isle of the Angles*.

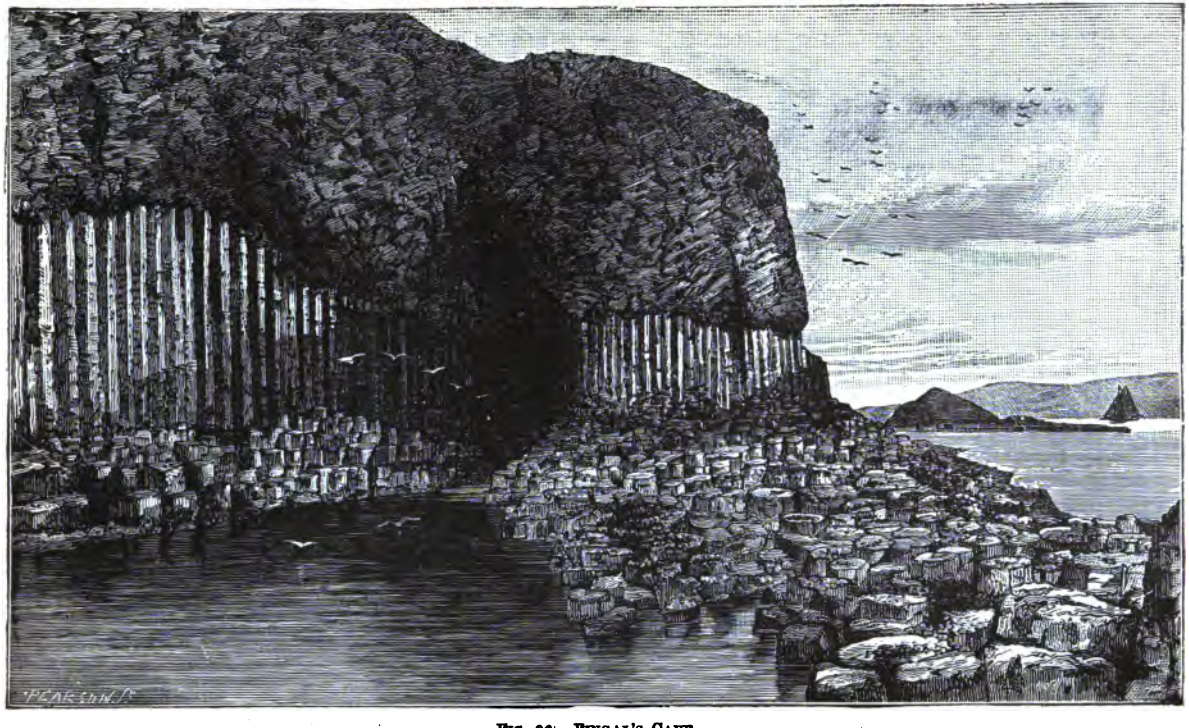


FIG. 36.—FINGAL'S CAVE.

The **surface** of Great Britain is very varied. The most mountainous part is the north-west of Scotland, which is hence known as the **Highlands of Scotland**, a region filled with hills, mountains, and valleys, running in various directions. It is divided into two portions by a depression known as **Glen More**,[1] or the Great Glen, running from Loch[2] Linnhe in the south-west to the Moray Firth in the north-east, and partly occupied by lakes connected with each other and with the sea by a ship-canal, which is not, however, much used. Near the south-western end of this depression is situated **Ben Nevis**, 4,400 feet high, the highest mountain in the British Isles, though 2,000 feet lower than Mount Washington, and nearly 10,000 feet below the height of the loftiest in the United States. The group of mountains to which it belongs is known as the **Grampians**, a group far too irregular to be properly spoken of as a mountain range. Many of the valleys in the highlands of Scotland are occupied by beautiful lakes. Of these the most celebrated are **Loch Lomond** and **Loch Katrine**, which have been made by the novels and poems of Sir Walter Scott familiar in the mouth as household words wherever the English language is spoken.

The boundary of the highlands of Scotland and the limit of the Grampians is a line stretching from south-west to north-east from the mouth of the estuary of the Clyde to a point near the middle of the east coast of Scotland, but lowlands also occupy the peninsulas which jut out in the east, as well as the shores of the **Moray Firth**, the great opening that lies between these peninsulas.

As stated already in describing the boundary between England and Scotland (p. 196), hilly country extends southwards as far as the valleys of the Eden and the Tyne. To the south of these valleys hilly country is again met with. A range of moorlands and hilly sheep pastures known as the **Pennine Chain** stretches southwards into the heart of England, but though it separates fertile plains in the east and west, it is sufficiently low to be easily crossed not only by railways but even by canals, so that it is possible for barges to be towed along navigable rivers and

[1] *More* means *great* in Gaelic, a dialect of Keltic still spoken to some extent in the highlands and islands of Scotland.

[2] A Scotch name meaning either a lake or a long inlet from the sea.

canals from the estuary of the **Mersey** in the west to that of the Humber in the east. West of the northern part of the Pennine Chain is a group of hills with valleys occupied by beautiful lakes, forming what is known as the **Lake District** of England, a great resort of poets, artists, and tourists. Here lie **Keswick Lake**, or Derwent Water, and **Lake Windermere.**

The **south-western peninsula of England**, which runs out to **Lizard Point** in the extreme south and **Land's End** in the extreme south-west, two bold rocky headlands, is mainly composed of low hills, moorlands, and pasture lands, and derives its chief wealth from its mines of tin, lead, and other metals for which it has been celebrated from ancient times.

The **south-east of England** as a whole is a region of plains and gently undulating lowlands, and, as already intimated (p. 190), contains most of the best agricultural land of the country. In the neighbourhood of the Wash, the region known as the **Fen Country**, the surface is so low and flat that it requires to be protected in some places against the sea, and has been made capable of cultivation only by the most careful drainage.

To the south-east of England belong all the chief **rivers** of the country except the Severn. The **Thames**, the longest and most important of all, rises within a few miles of the estuary of the Severn, and flowing eastwards enters the German Ocean by a magnificent estuary which can be ascended as far as the London Docks by the largest vessels afloat. The estuary of the **Humber**, which is likewise well suited for ocean commerce, receives at its head the **Trent**, which drains the midland counties, and the **Ouse** which flows southwards through the fertile vale of York, and receives numerous tributaries from the dales which cut through the moors of the Pennine Chain on the west. The **Severn** takes its rise in the heart of Wales, and sweeping round to the east traverses some of the finest English counties, but unfortunately terminates in a shallow estuary the navigation of which is much impeded by sandbanks.

Towns in England and Wales.—1. Seaports and Coast Towns.—LONDON (4,437), the capital of the British Empire, is situated at the head of navigation for large vessels on the Thames, a situation all the more important because the estuary of that river directly faces that of the Scheldt, the great continental estuary which leads up to the seaport of Antwerp. It hence early became an important seat of

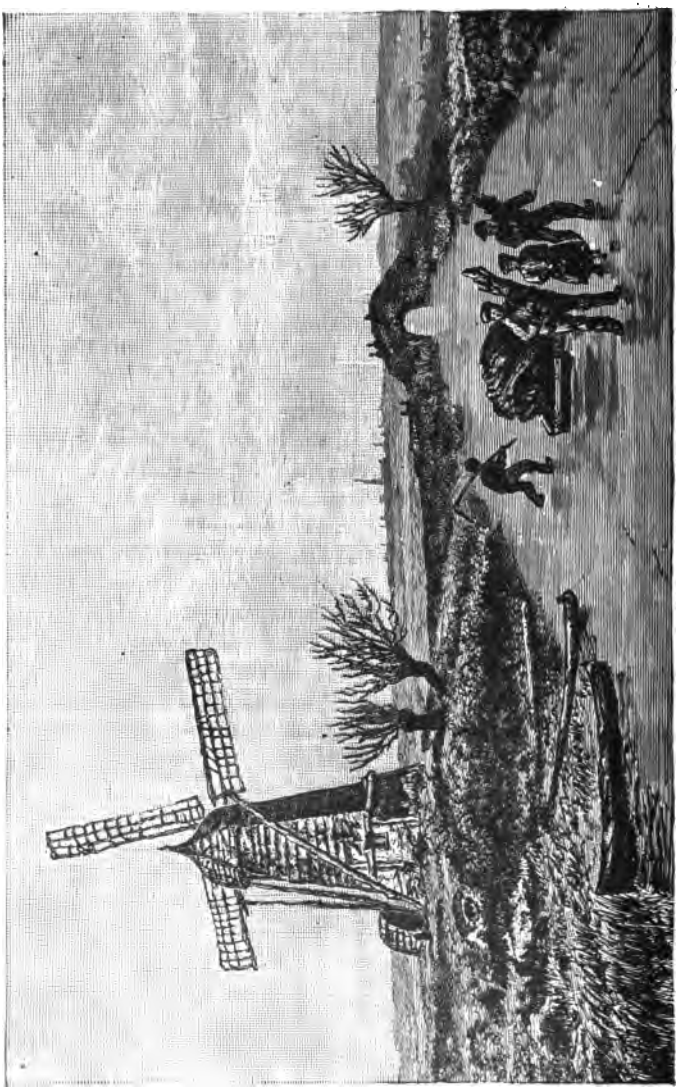


FIG. 37.—WINTER SCENE IN THE FEN COUNTRY. (From Heathcote's 'Fen and Mere,' by kind permission of the Author.)

foreign commerce, as well as the centre of inland commerce between the north and south of England. Since the time of William the Conqueror it has been the virtual capital of the country, and as the country grew in wealth and power, so also did London grow in size and importance. As the commerce of the country became world-wide, so also became that of the port of London. In its growth it has come to embrace many surrounding cities and towns, the most important of which is the ancient city of **Westminster**, which lies, like the city of London proper, on the left bank of the Thames in the county of Middlesex; and now London in the larger sense, including all the contiguous boroughs returning members to parliament, has a **population** of **more than four millions**. As capital of the country it is the seat of the supreme courts of law, the houses of parliament, one of the royal palaces, one of the palaces of the Archbishop of Canterbury, of the chief public libraries and museums. As a seaport London predominates in imports, since it receives the bulk of the commodities brought to the United Kingdom from Australia, eastern Asia, and southern Africa. **Greenwich** is the seat of the royal observatory, the meridian of which has now been adopted by most civilised countries as the starting-point in reckoning degrees of longitude. Lower down on the south side of the estuary of the Thames are important towns possessing arsenals and government dockyards as well as watering-places.

HULL (200), on the north side of the estuary of the Humber, nearly opposite the continental estuaries of the Elbe (with Hamburg) and the Weser (with Bremen), the point of convergence of the railways belonging to the valleys of the Trent and Ouse and their tributaries, has a large trade with the continent of a very general nature. The estuary of the Tees further north is of less consequence, but in recent years has become noted for one special product, **iron**, abundant ores of which have been found on its southern shores, and have raised into importance the town and seaport of **Middlesbrough**. **NEWCASTLE**, at the head of sea-navigation on the Tyne, has been noted for another special product, **coal**, for a much longer period, and for that reason has given name to other towns elsewhere, such as Newcastle in New South Wales, rich in the same mineral. The coal-fields round about supply domestic coal of the best quality, which is exported to many parts of the world. A constant stream of steamers laden with coal proceeds along the east coast from the Tyne for the supply of London alone.

South of London the port of **Dover**, which occupies a notch in the chalk cliffs here forming the English coast, has long been celebrated as the starting-point of the shortest passage to the mainland of Europe (the Dover-Calais route). **Hastings**, on the south coast, formerly a seaport, is now only a watering-place and fishing-station. Historically it is celebrated as giving name to the battle in which William the Conqueror defeated Harold of England in 1066, though the battle was actually fought at a place a few miles distant. **BRIGHTON**, further west, has become within the last century the most celebrated of all English watering-places, the ease with which it can be reached from

London being one chief cause of its being so largely frequented. Still further west, nearly opposite the eastern end of the Isle of Wight, stands **PORTSMOUTH** on a deep and spacious natural harbour with an easily defended entrance, on which account it has been one of the chief naval stations of England since the time of Henry VIII. in the sixteenth century. **Southampton**, at the head of the inlet which forms a continuation of the channel on the north-east of the Isle of Wight, is the busiest mercantile port in this region. **Plymouth** and **Devonport** form together another arsenal and royal naval station occupying an inlet in the south-west (between the counties of Devon and Cornwall), equally spacious and easily defended with that of Portsmouth, and much more beautiful.

On the west coast the principal seaport down to last century was **BRISTOL** (221[1]), on the Lower Avon, six miles above its mouth in the Bristol Channel. Lying nearer than Liverpool to the West Indies and the American mainland, and nearer also to London, it was more favourably situated than the latter port for commerce with the west before the development of manufacturing industry increased the population in the northern counties. Being situated on a coal-field it is in itself a manufacturing town. On the opposite side of the Bristol Channel, **CARDIFF** in South Wales has rapidly risen into importance on account of its vicinity to a great coal-field, the coal from which is smokeless and well adapted for steamships and for smelting, so that Cardiff now exports more coal, and that of greater value per ton, than Newcastle. **Swansea**, further west, lies on the same coal-field, and has probably the largest smelting industry in the world, ores being brought from all parts of the globe (copper ores, for instance, from South Australia) to be smelted here. The old Roman city of **Chester** on the Dee stands on too shallow a river to be of much importance as a seaport at the present day, and now by far the most important seaport on the west coast is **LIVERPOOL** (517) on the estuary of the Mersey. This estuary is broad and deep, but its shores are low, so that docks had to be constructed in order to provide wharfs. Hence as late as the beginning of last century Liverpool was little more than a village, and not till the great cotton industry developed in the neighbourhood did it grow into the great seaport that it is—the rival of London, possessing six or seven miles of continuous docks, a sight unparalleled elsewhere. Importing grain and other food products, cotton and other raw materials of manufacture, it sends out manufactured articles to all quarters of the globe.

2. Inland Towns.—The chief inland towns of England are great manufacturing and commercial centres, and are almost all situated on coal-fields on which different branches of industry are carried on. **MANCHESTER** (including Salford, 700), on a small tributary of the Mersey, has long been famous for its woven fabrics, and for about a century as the centre of the cotton manufacture, which is carried on in a large number of towns round about. Manchester has recently been made a seaport by the construction of a ship canal, capable of being used by the largest vessels afloat. The canal begins

[1] Census of 1891.

on the south shore of the Mersey and is about thirty-five miles long. Of the manufacturing towns surrounding Manchester the largest is **OLDHAM**, which is noted not only for its cotton manufactures, but also for the making of machinery for cotton and woollen mills. Almost all the cotton-manufacturing towns belong to a coal-field on the west side of the Pennine Chain in the county called Lancashire. On the east side of that range, in the south-west of Yorkshire, is another large coal-field, the towns on which are chiefly engaged in the woollen manufacture, for which the adjacent sheep pastures at one time supplied the bulk of the material. The most important of these towns are the adjacent towns of **LEEDS** (367) and **BRADFORD** (216). Further south on the same coal-field, in a district yielding also excellent irons and a kind of stone admirably suited for making grind-stones, stands the town of **SHEFFIELD** (324), which has for these reasons long been noted for its cutlery. Steel in all shapes, and not merely cutlery, is now the product with which the name of Sheffield is most properly associated. Still further to the south or south-east stands **NOTTINGHAM** (211), on the Trent, with manufactures of lace and hosiery.

Other coal-fields lie in the heart of the country between the Trent and the Severn. In the south of this area lies **BIRMINGHAM** (429), the world-renowned centre of all kinds of hardware manufacture, though it is only the chief of many adjacent towns engaged in the same industries, which are fostered by the presence of abundance of iron as well as coal. In the north of the area is the district known as the **Potteries**, from the fact of its being occupied by several towns engaged in the manufacture of earthenware. For this industry the neighbourhood furnishes many suitable kinds of clay, though the finest kinds have to be sent from the south-west of England.

Among the towns that owe their celebrity to other causes than their manufacturing industries may be mentioned **Stratford-upon-Avon**, the place of birth and death of Shakspere, on the Upper Avon, a tributary of the Severn; **Bath**, on the Lower Avon above Bristol, noted even in Roman times for its hot medicinal springs; and **Windsor**, on the Thames, a favourite residence of the kings and queens of England.

Towns in Scotland.—The only inland town of great importance in Scotland is **EDINBURGH** (261), the capital, near the south shore of the Firth of Forth a city celebrated for the beauty of its situation and for its great medical school. Though strictly speaking an inland town, it is closely connected with **Leith**, which is an important seaport on the Firth of Forth. A few miles above Edinburgh, near the narrowest part of the Firth of Forth, a railway bridge has been constructed across that estuary. On the Clyde on the west side of the country stands **GLASGOW** (565, with suburbs nearly 800), now the chief seaport in Scotland and one of the largest manufacturing towns in the United Kingdom. The river on which it stands was formerly only a shallow stream at this point, but the discovery not only of rich coal-fields, but of abundant deposits of the finest iron ores, developed manufacturing industries of various kinds to such an extent that it became worth while to deepen the river so much as to allow of the ascent of the largest trading steamers. The existence of these minerals has like-

wise made the Clyde the greatest seat of shipbuilding in the world since iron and steel came to be used as the chief materials for the purpose. Lower down on the south shore of the estuary of the Clyde stands the port of **Greenock**, which has a large sugar industry. **DUNDEE**, on the north side of the estuary of the Tay, here crossed by a railway bridge, is a seat of jute and linen manufactures (including sailcloth). **Perth**, higher up on the **Tay**, was one of the early capitals of Scotland, but is now of minor importance. **ABERDEEN** is an important seaport and manufacturing and university town at the mouth of the Dee, on the east coast.

IRELAND.

IRELAND is an island about three-fourths the size of Newfoundland. With this latter island it agrees in having a very irregular coast-line, and the character of its surface is similar. The greater part of Ireland is a low-lying plain. The mountains belonging to it are mostly collected in groups or short chains near the corners. The highest summit belongs to the Macgillicuddy Reeks in the south-west of the island; a range which, though short, boasts a greater renown than many a longer and loftier chain from the fact that it overlooks the beautiful **Lakes of Killarney**, an annual resort of thousands of tourists.

So level is a large part of the surface of Ireland that the natural drainage of the country by its rivers is very imperfect. Excess of moisture ruins a large part of the soil. **Nearly a tenth of the entire surface is occupied by bog**, the western counties, which are directly exposed to the westerly rain-bearing winds, suffering most in this respect. Nevertheless, there are large tracts elsewhere possessing great natural fertility.

The principal river is the **Shannon**, the longest river not only in Ireland but in the British Isles. It flows sluggishly from north to south through three considerable lakes, and finally turns westwards and enters the Atlantic Ocean.

Manufacturing industries being few, for the reason stated on p. 192, the greater part of the population is engaged in agriculture, but the state of agriculture is more backward than in any other part of the British Isles.

Besides being divided like Great Britain into counties Ireland has long been divided into four chief sections, called provinces. These are—**Ulster** in the north-east, **Leinster** in the south-east, **Munster** in the south-west, and **Connaught** in the north-west,

Of these Ulster, in which a large proportion of the inhabitants are Protestants descended from English and Scottish settlers, is the part of Ireland in which agriculture and other industries are most advanced. The Irish proper are a Keltic race, and many of them still speak a Keltic dialect (see p. 195).

Chief Towns.—The capital is **DUBLIN** (including suburbs, 361), at the mouth of the **Liffey**, and the head of a fine bay in the middle of the east coast. It formerly carried on various branches of manufacture, but now the only products for which it is noted are whisky and porter. **BELFAST** (256) at the head of Belfast Lough is the chief town in Ulster, the great seat of the Irish linen manufactures, the only great manufacturing town in the island, and the only one with a rapidly increasing population. **Londonderry**, at the head of Lough Foyle in the north of Ireland, is a place of historical note, but the inlet on which it stands is too shallow to allow of its being reached by large vessels. **Cork**, at the head of a fine estuary on the south coast, is the third town in Ireland in point of population, and a place of export for the produce of the surrounding district, principally butter. **Queenstown** (so named in honour of Queen Victoria), on a small island within the estuary, is noted as a place of call for ocean-going steamers.

FRANCE.

Approximate latitudes: (Dover), north point of France (Leipsic), 51° N.; Paris, Nancy, 49°; Rochefort, Mont Blanc (Trieste), 46°; (Buffalo), middle of Pyrenees (Balkan mountains), 43°.

Approximate longitudes: Cape La Hague, mouth of Loire, 2° W.; Havre, 0°; Nancy, Toulon, 6° E.

France is a country about equal in size to the combined areas of the New England States, New York, Pennsylvania, and Ohio. It lies between the Atlantic Ocean and the Mediterranean Sea, and is separated from Spain on the south by the **Pyrenees**, from Italy on the south-east by the **Alps**, from Switzerland mainly by the **Jura Mountains**, and from Germany partly by the Vosges.

The **surface** is made up in the western half mainly of level plains and gently undulating lowlands, but it rises in the east. Towards the south-east there is a broad plateau about 3,000 feet in height, and its steep south-eastern edge is surmounted by a range of mountains called the **Cevennes**. On this plateau the **Loire**, the longest river in France, takes its rise in two large headstreams (the Loire to the east and the Allier to the west) which flow

northwards in deep valleys; and the fact that these two great valleys, containing the most densely populated parts of the plateau, open cut on the most important part of the French plain, is another circumstance of great consequence in promoting the unity of the French people. Round **Clermont** the Valley of the Allier expands into a broad upland plain, the **Limagne**, one of the most richly cultivated districts in France, a district the fertility of which is all the more striking from the contrast it presents to the desolate tablelands adjoining. Of these tablelands, that on the west, forming the **Plateau of Auvergne**, is one of the wildest parts of France, and at the same time one of the most remarkable in its scenery, being crossed from north to south by a line of long extinct volcanoes (**Puys**), the craters of which are still in most cases quite distinct.

The **northern highlands** of France are under 1,500 feet in average elevation, and are generally also plateau-like in character. The heights between the depression marked by the Canal du Centre and that marked by the Burgundy Canal take

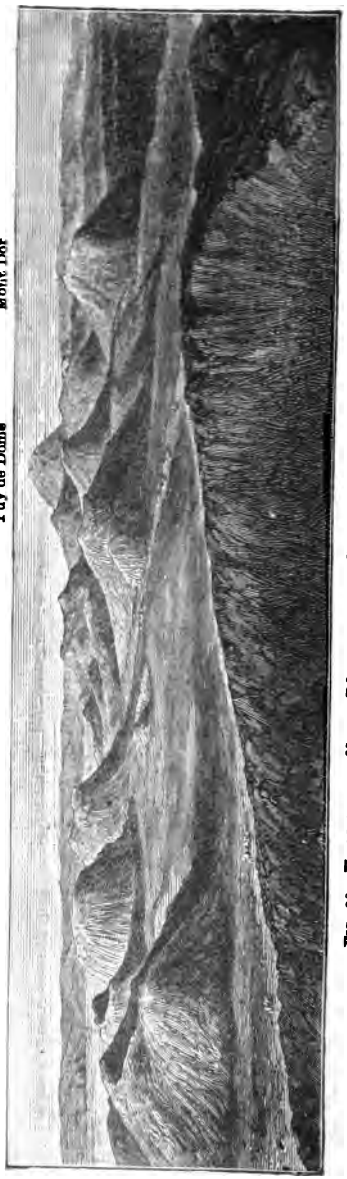


FIG. 83.—VIEW OF THE MONTS DÔME FROM THE SUMMIT OF THE PUY CHOPINE, AUVERGNE.

the name of **Cote d'Or** (Gold Coast), from the fact of having their eastern flanks clothed with the rich vineyards that produce Burgundy wine. To the north lies the **Plateau of Langres**, which is connected with the Vosges by the **Faucilles**, a sickle-shaped ridge, concave on the south. Further north follow the Ardennes, once a vast forest, of which the chief relic is the **Forest of Argonnes**.

The **western highlands**, those of Brittany and the west of Normandy, are under 1,000 feet in average height, and are not so much plateau-like in character, but rather like the highlands of Britain, a succession of ridges running in all directions and opening into one another.

For an account of the frontier mountains of France, see ALPS, SPAIN, and SWITZERLAND.

Of the **plains** of France, the **rivers** are the most important features. The fact that the French highlands lie so far from the sea allows most of the principal rivers to develop into considerable streams with a gentle current in the lower tracts of the country. They are hence of great importance for inland navigation, and the low elevation of the various water-sheds has favoured the connection of the principal river-basins by means of canals. The **Loire** is navigable for between 400 and 500 miles (about three times as far as the Hudson River). The **Seine** and its principal tributaries (**Marne, Yonne**) are also navigable far into the interior, and it is by means of an affluent of the Yonne that the Seine basin is connected by canal with the Saône and Rhone. The **Rhone**, flowing, unlike the other great French rivers, in a narrow valley, but amply fed by mountain torrents (on the east glacier streams), is full-flooded but impetuous, and hence, though navigable for large vessels from Lyons downwards, cannot be easily ascended. Since the opening of the Lyons and Marseilles railway, the navigation has dwindled away to a comparatively small amount. The gently flowing Saône, the tributary which the Rhone receives on the right from the Burgundian Plateau, is a marked contrast to the main stream. Altogether France has about a hundred navigable rivers, most of which have their entire course within her frontiers.

The **climate** of France exhibits the mitigating influence of the Atlantic, and its warm winds and currents in the west, but less in the east, where there are greater extremes. Hence, while

the coast of Brittany has a winter mild enough for camellias, Chinese bamboos, and other plants belonging to a sub-tropical climate, to flourish in the open air, but a summer too cold and damp to be favourable to wheat cultivation; farther east, in the same latitude, the warm summers mature the fruit from which Champagne wine is made, though the winters are cold enough to kill even the holly and the gorse.

Of the **agricultural products**, **wheat** is, as in England, the principal cereal, but to the crops of England France adds, in the warmer parts, **maize**, **wine**, **sugar-beet**,[1] **tobacco**, and in the Mediterranean provinces the **olive** and **mulberry** (the latter for the rearing of silkworms). Wine is of special importance, for France is the greatest wine-producing country in the world. The chief wine-growing districts are the valley of the Garonne in the south-west, and Champagne and Burgundy in the east.

The **mineral wealth** of France is relatively small. There are **two chief coal-fields**. In the north the Belgian coal-field extends into France, and, being rich in iron, supports a dense industrial population, gathered into large towns.

Of these the chief are **LILLE** (201), **ROUBAIX**, **Tourcoing** (the two latter of recent growth), all chiefly engaged in spinning and weaving. The other coal-field, also rich in iron, is on the eastern borders of the Central Plateau, and the chief towns belonging to it are **ST. ETIENNE** and **Creusot**. The former is not only itself a large manufacturing town, producing chiefly hardware and silks, but also supplies with coal the still more important manufacturing town of **LYONS** (416), the leading town in Europe for the making of silk and velvet fabrics.[2]

In the **commerce** of France **wine** and **woollen** and **silk fabrics** are the **chief exports**, and the **chief imports** are the **raw materials** for the woollen and silk as well as cotton industries, together with **grain**. **Wool** has the first place among the raw materials, and there is no other country in the world which imports so much of this article for use in its own manufactures. Much of this wool is of Australian origin, obtained either direct or by way of Great Britain, but a very large proportion is from the Argentine Republic and Uruguay.

The **people** of France are mainly of Keltic origin, but during four centuries of Roman domination were so completely Romanised that a Keltic dialect is now spoken only in a part

[1] See p. 223, n. 1.

[2] Lyons is the birthplace of Jacquard, the inventor of an ingenious loom for the weaving of patterns in silk and other fabrics.

of Brittany,[1] and the Latin language, altered by degrees into the modern French, has spread over almost the entire country. The Roman domination was overthrown in the fifth and sixth centuries by Teutonic invaders (**Western Goths** or **Visigoths** and **Franks**), but these settled among the civilised subjects of Rome, and in the end adopted their language. At the end of the eighth century a Frankish king, Charlemagne, extended his sway eastwards beyond France as far as Bohemia, and southwards as far as the Ebro; but his dominion did not survive him, and during the Middle Ages France was little more than an assemblage of independent principalities, nominally united under one king. This state of matters favoured the settlement of Normandy[2] by the **Normans** (Danes and Norwegians) in the tenth century, and the English conquests in the fourteenth and fifteenth centuries; and not till after the English were finally driven out did the French monarchy become strong. The fiefs or practically independent principalities became **provinces** of the French kingdom, and though these provinces are not now recognised, some of their names are still familiar, as applied to well-marked districts. Since the Revolution at the end of last century, France has been divided into **departments**, of which there are now eighty-seven. At the same time France exchanged a monarchical for a republican form of government, and though there have been several changes since then, the **government** has been **republican** since 1870. The **religion** is Roman Catholic. Elementary **education** is in a backward condition.

Towns and Districts.—1. The Northern Plains (basin of the Somme and greater part of that of the Seine), an agricultural and industrial region, which derives great advantage for its commerce from its vicinity to England.

The great industrial towns of the north have already been mentioned. Of the coast towns, **Calais, Boulogne,** and **Dieppe** are chiefly important as points of departure and arrival on different routes between France and England, their harbours not admitting vessels of the largest class. Calais is interesting from an historical point of view, also as being the last place on the French mainland held by England

[1] This dialect is called *Armorican*, from the ancient name of Brittany.

[2] In Normandy some of the suffixes common in the names of English towns of Scandinavian origin reappear under different forms. For example, *-by* appears under the form *-bœuf*, as in Quittebœuf (the Norman equivalent of the English Whitby), *-toft*, under that of *-tot*, as in Yvetôt.

(lost only in 1558). **LE HAVRE**, or Havre (that is, 'the port'), at the mouth of the Seine, founded by Francis I. (sixteenth century), is the chief French seaport on the west coast, the starting point of the French telegraph cable to America, and the chief seat of the French trade with that continent, whence it imports cotton and some other materials of French industry, as well as articles of food. **ROUEN**, the former capital of Normandy, higher up the Seine, can be reached by smaller sea-going ships, and hence is to some extent a seaport of Paris, while at the same time it, with the surrounding towns, is a great seat of cotton manufactures, and thus is for Havre on a small scale what Manchester is for Liverpool. Still higher up, just below the junction of the Seine and Marne, stands **PARIS** (2,447), the capital city, in the centre of northern France, and at the meeting-place of the two chief roads to the south,[1] the one by way of the valley of the Rhone, and the other crossing at Orléans and Poitiers, the depression separating the Central Plateau from the highlands of Brittany.

Originally built on a small island in the middle of the river (now the heart of the city), it at present occupies both banks and contains 2½ millions of inhabitants, second to London alone among the cities of the world in point of population. Its exposed situation renders defensive works necessary, and, besides being surrounded by a strong wall, it is protected by a ring of forts extending a considerable distance into the country round. Famous all over the western world as the centre of fashion and elegance, it is in France without a rival in influence, the focus of all the best intellect and energies in the country, and the originator of all the movements by which the destiny of the people is decided. W.S.W. of Paris is **Versailles**, formerly a favourite residence of the French kings, from Louis XIV. downwards.

2. Lowlands of the Loire basin with Brittany and western Normandy, a district without important industrial towns, but containing many towns of historical celebrity. On the deeply indented rocky coast of Brittany, the inlets, though like those in the West of Ireland, Wales, and the Scottish Highlands, too far removed from the seats of agricultural, manufacturing, and mining industry to serve as seaports, are well suited for naval stations, of which there are two on these coasts—**Lorient** on the south, and **Brest** on the west (the Plymouth and Portsmouth of France). On the less favoured coast of Normandy another great naval station has been constructed at great expense at **Cherbourg**, on the small bay in the north of the western peninsula facing the south coast of England. The coasts of Brittany abound in fish (sardines, &c.), and the fishermen are the hardiest seamen in France.

There are two seaports at or near the mouth of the Loire: **NANTES**, 30 miles from the mouth, the elder of the two, now, in consequence of

[1] See Introd. p. 61 (3).

the silting of the river bed, accessible only for small sea-going ships, and hence superseded for large vessels by **St. Nazaire**, at the mouth.[1] Higher up the Loire valley are **Angers**, on the Maine, the capital of the former province of Anjou; **Tours**, on the Loire itself, capital of that of Touraine, 'the garden of France;' and **Orléans**, capital of the much less fertile Orléannais, a town which has long been of importance in consequence of its favourable position, (1) at the bend of the river Loire, and (2) at the point where the river is crossed by the highway from Paris to the south-west[2]; **Poitiers**, on a tributary of the Vienne, to the south of the Loire, capital of Poitou, an old and old-looking town, long important on account of its position on the same highway. Higher up the same tributary, on the skirts of the Central Plateau, stands the considerable town of **Limoges**, capital of the old province of Limousin.

3. South-western France (greater part of the Garonne basin, with those of the Charente and Adour). The principal old provinces of this region are Guienne,[3] on both sides of the Lower Garonne, and Gascony, in the south-west, named after the Basques,[4] a small remnant of whom still occupy the extreme south-west corner.

In the northern part of this region there are no towns with more than 50,000 inhabitants, not even the fortified coast towns of **La Rochelle**, and **Rochefort** (the latter a naval station); but on the Garonne a short distance above the head of the long estuary of the Gironde, formed by the union of that river with the Dordogne, stands **BORDEAUX** (252, the ancient *Burdigala*), the third seaport in France, the place of export of the claret of Médoc and other wines grown in the surrounding country. Here also, however, has arisen lower down a seaport for larger steamers, **Pauillac**, on the left bank of the Gironde.

The tract on the coast south of the Gironde is the flattest in France, and one of the most unhealthy and least populous,[5] though it has increased in population and salubrity within the last generation, since it has been drained by a well-constructed system of canals. Formerly the population consisted mainly of shepherds, who tended their scattered flocks on stilts.

The fortress of **Bayonne**, at the mouth of the Adour, is said to have given name to the bayonet (though this is not certain). **Pau**, at the base of the Pyrenees, on a rapid Pyrenean tributary of this river, called the Gave de Pau, is celebrated as a resort for invalids.

4. The North-eastern Highlands (part of the Meuse and Moselle basins, and those of the head-waters of the Seine).

In the extreme north-east is the portion of the province of Lor-

[1] See Introd. p. 61 (1) (*c*).
[2] See Introd. p. 61 (2).
[3] A corruption of the ancient *Aquitania*.
[4] See Spain, p. 267.
[5] In the north of the department of Landes and the south of that of Gironde there is an area about twice as large as Rhode Island, in which the population is less than 50 to the square mile, or only one-fourth the average density.

raine left to France after the Franco-German war, with the fortified towns of **Verdun** and **Toul**, and the considerable manufacturing town of **NANCY**. To the west lies the province of Champagne, the greater part of which has a chalky soil, which is suited for little but sheep pastures, and hence supplies wool to the woollen manufactories, which are the source of the present prosperity of the historically celebrated town of **Reims** (where the French kings used to be crowned). The western slopes of the hills in this province are planted with carefully tended vineyards producing the famous wine, in the making of which the numerous lime-stone caves play an important part. The trade in champagne is centred at **Epernay** and at **Châlons-sur-Marne**.[1]

5. The Central Plateau, for the most part bleak, unproductive, and thinly peopled, especially in the south, has no considerable towns except those already mentioned (**Clermont**,[2] **St. Etienne**,[3] **Creuzot**[3]). Here the Arverni, who give name to the province of Auvergne, offered a stubborn resistance to the Romans, and in the Middle Ages and down to the second half of the seventeenth century numerous practically independent barons occupying strong castles defied the authority of the kings. At present the Auvergnats, a frugal honest race, are chiefly known, like the inhabitants of Savoy and other mountainous districts, for their habit of migrating to the richer provinces of France to earn a living, but always returning when they can to their unproductive but much-loved homes.

6. Valley of the Saône and Rhone and Mediterranean Region.—The northern part of this section of France (one of the most populous in the whole country) once formed the nucleus of the Duchy of Burgundy with the Franche Comté, the former of which was united to the kingdom of France towards the close of the fifteenth century, the latter not till two centuries later.

Dijon, where the Burgundy Canal quits the vineclad slopes of the Côte d'Or, is the centre of the trade in Burgundy wine. **Châlon-sur-Saône** is a place of some importance in consequence of its situation at the point where the Canal du Centre communicates with the Saône. On the Doubs, a tributary of the Saône, stands **Besançon**, on the flanks of the Jura, a town in which watchmaking is the chief business, as it is in other towns within the Jura. Lower down there are on the Rhone, besides Lyons, **Avignon** and **Arles**, and a little to the west of the right bank **Nismes**, the last two, under the names of *Arelate* and

[1] The province of Champagne containing the first extensive plains that have to be traversed by an army entering France round the northern end of the Vosges possesses numerous battle-fields. The plain round Châlons, the very first to be crossed, is the *Catalaunian Plain* on which Attila king of the Huns was defeated in a tremendous battle, by the Roman general Aëtius (451 A.D.).

[2] See p. 206. [3] See p. 208.

Nemausus, important towns in the ancient *Provincia*[1] (Provence), and interesting on account of their Roman remains; on the Isère, a left-bank tributary of the Rhone, **Grenoble** (see **Alps**). West of the Lower Rhone the greater part of the region once formed the province of **Languedoc**, the chief town in which is the long celebrated **TOULOUSE**, on the Garonne, at the place where that river is joined by the Canal du Midi (southern canal), the canal which connects the Mediterranean with the Atlantic Ocean by means of the Garonne and other canals parallel to the Garonne. In the same old province, near the coast, is **Montpellier**, with a celebrated school of medicine founded by Arabs.[2] The still important seaports of the Mediterranean coast are confined to the east, and among these is the greatest and oldest of all French seaports, **MARSEILLES** (403), the ancient Massilia, a town which was founded by a Greek colony in the eighth century **B.C.**, on a fine bay as near as possible to the delta of the Rhone,[3] and speedily developed into a great seaport on account of its situation at the end of the only convenient route connecting north Europe[4] with the western half of the Mediterranean. Farther east is the almost impregnable fortress of **Toulon**, with a naval station; and under the shelter of the spurs of the Alps are the mild health resorts of **Cannes**, **Nice**, and **Mentone**, and between the two latter **Monaco**, the capital of a nominally independent principality less than ten square miles in extent. The unsheltered parts of this coast are exposed to a hateful scourge in the form of a bitterly cold wind, known as the **mistral**, which sweeps down from the cold plateau on the north-west, or the icy summits of the Alps in the north and north-east. At Marseilles it blows on an average for nearly half the number of days in the year.

The highly mountainous island of **Corsica** (about twice as large as Long Island) has several summits between 8,000 and 9,000 feet in height, and is thinly peopled by an Italian-speaking population.

It has two small coast towns, **Bastia** in the north-east, and **Ajaccio** in the west, the latter celebrated as the birthplace of Napoleon Bonaparte.

BELGIUM AND HOLLAND OR THE NETHERLANDS.[5]

(With the Grand-Duchy of Luxemburg.)

Approximate latitudes: (Birmingham), Amsterdam (Berlin), 52½°; Antwerp (Leipzig), 51°.

Approximate longitudes: south-west point, 2½° E.; north-east frontier, 7° E.

[1] So called as being the first Roman *province* formed in France (*Gallia transalpina*).

[2] See Spain, p 264 n. 1.

[3] On the marshy and unhealthy delta itself there is no suitable site for a seaport.

[4] Through the valleys of the Rhone, Saône, and Rhine.

[5] Kingdom of the Netherlands is the name given by the people of that kingdom

The south-east portion of the territory forming these two countries belongs to the highlands of Central Europe, and attains an elevation of from 1,500 to 2,000 feet. Thence the surface gradually sinks towards the west and north, till it forms the lowest part of the European plain. A large area in the west even lies below sea-level. At one time the **chain of downs** which begins in the north-east of France and ends on the west coast of Jutland was continued right round the coast of Belgium and the Netherlands, being only broken by the mouths of the

FIG. 89.—WINDMILLS FOR THE DRAINING OF A POLDER AT ZAANDAM, NORTH HOLLAND.

Rhine, Maas, and Scheldt; but the land here subsiding enabled the sea to break in and convert the deltas of these rivers into a network of sea-channels. Farther north, the sea in the thirteenth century bursting in through the downs now forming the islands of **Texel**, **Vlieland**, &c., brought a lake which then occupied the south-eastern part of the present **Zuider Zee**[1] into

to the country which we call *Holland*, the latter name being applied by them only to two low-lying provinces in the west (provinces which, however, contain the bulk of the population). Formerly the name Netherlands included most of the provinces of both Holland and Belgium of the present day.

[1] Pronounced *Zoider zā*, Dutch = 'South Sea.'

connection with the ocean, and spread over a large area that intervened. Little of the land then lost has since been recovered; but in the west, where the submerged area was overspread with deposits from sea and river, fitting the ground when drained for rich pasture lands and fertile corn-fields, a district somewhat larger than the state of Rhode Island has been added to the land surface of the country since the sixteenth century. All this part of the country, as well as other low-lying tracts subject to occasional flooding, are divided up into sections called **polders**, enclosed by **dykes**, or artificial embankments, and drained by pumping machinery. This machinery is mostly driven by windmills, for the flatness of the country and its proximity to the sea enable the winds to blow over it with the same steadiness as over the ocean, and thus to form an unusually serviceable source of power.

The chief **rivers** of Belgium and the Netherlands all have their sources outside the boundaries of these countries. The Rhine, entering from Germany on the east, soon divides into two branches, that on the right retaining the name of the **Rhine**, while that on the left receives the name of **Waal**. The former gives off on the right two small branches (the second of which again divides), while the main stream is continued under the name of the **Lek**. The **Waal** ultimately unites with the **Maas**, and this name is henceforth applied to the single stream, which lower down receives the Lek also.

The **Maas** (French, *Meuse*) enters Belgium on the south from France, receiving thence also its largest tributary, the **Sambre**, on the left, and before joining the Waal describes a semicircle to the east; a similar curve is described by the other principal river, the **Scheldt** (Fr. *Escaut*), which also enters on the south from France, and also receives from the same country on its left bank an important tributary, the **Lys**.

The union of the Maas and Rhine constitutes in one way a peculiar danger for the Netherlands, since the fine mud which they carry down from the higher parts of their course is steadily deposited in the sluggish reaches near their mouth, where accordingly the bed of the united rivers is constantly being raised higher and higher, the surface ever nearer the tops of the embankments, which thus have from time to time to be raised in height. To remedy this it is now proposed to dig a new channel for the Lower Maas, so as to prevent its union with the Rhine. (See Introd. pp. 27–8.)

In other respects the rivers, of the Netherlands especially, are of extreme value, for they are not only themselves navigable channels, but their height above the land makes it peculiarly easy to feed navigable canals by their means, and all the chief dykes have canals as well as roads running along them. Canals are numerous even in the cities.

The **density of the population** is high in both countries. In Belgium[1] it is higher than in any other country in the world except Saxony, which is only half the size. In both countries this high density is due in part to the same causes, the advanced condition of **commerce and agriculture**. The Dutch[2] in particular are a nation of merchants, and the value of the foreign commerce per head of population is greater than in any other country in Europe. This pre-eminence is largely due to the vast colonial possessions[3] in Asia, whence the mother country derives immense quantities of coffee, sugar, rice, indigo, spices, &c., much of which is re-exported.

Agriculture is almost everywhere pursued with the greatest industry and success, though it has not in all places the advantage of a rich soil such as that of the Polders. In both countries there are large tracts where the soil is naturally unfruitful, but even these have in great part been rendered fertile by the labour of centuries. In the north-east of Belgium and south-east of the Netherlands there is, however, a large area of sandy soil which is still thinly peopled, and in the east of the Netherlands extensive peat-bogs which are only with difficulty brought under cultivation by draining the land by means of deep canals and trenches, stripping the surface of peat (for fuel) and manuring the underlying soil. Such tracts are known as **Hohe Veenen** (high fens).

In the Netherlands cattle-rearing is more general than tillage, and hence **butter, cheese, and live animals** are what that country supplies most abundantly to others out of its own resources. In Belgium, on the other hand, tillage predominates, and besides great quantities of **grain**[4] there is produced much **flax** and **beet**.

In both countries the chief grains are rye, wheat, and oats. Wine is grown in the south-east (including Luxemburg). Except

[1] Over 540 to the square mile.

[2] This term, a corruption of the Ger. *Deutsch*, meaning German, was applied to the Germans in the last century, but is now applied to the people of the Netherlands.

[3] See p. 285.

[4] Relatively to area, Belgium produces a greater quantity of grain than any other country in the world regarding which statistics can be obtained.

wine, the Netherlands grow in smaller quantity all the products of Belgium, and in the former country the growing of vegetables and ornamental flowers (**Dutch bulbs**) is an important specialty.

But besides commerce and agriculture the inhabitants depend to a large extent on **manufacturing industry**, those of Belgium also on **mining**, and it is chiefly to this cause that the extremely high density of population is due. The outer margin of the plateau in the south-east, like the margin of the same plateau in west Germany, is occupied by a rich coal-field, containing also iron, the products of which not only support large manufactories in Belgium itself, but also supply a large surplus for export, chiefly to France. The **chief manufactures** of Belgium are **cotton, linen, and woollen** goods, and **machinery**; and the chief manufacturing centres are **Liège**, on the Meuse, **Mons**, on a tributary of the Scheldt near the French frontier, and **Ghent**, at the confluence of the Scheldt and Lys. Besides coal and iron, **zinc** is also an important mineral product.

In Holland also **linen** and **cotton** manufactures are highly important, and Holland now comes next after Great Britain in the quantity of raw cotton it imports per head of population, to be made into yarn or cloth in the country. Another important mechanical industry is the building of **wooden ships**, the timber for which is floated down the Rhine from the Black Forest. Various industries are, however, pursued on a small scale, and as in draining the polders the wind is very largely made use of to drive the machinery for the purpose. Windmills grind corn, coffee, and chocolate, scutch flax and hemp, bruise oil-seeds, mash paper-pulp, and perform other operations.

To understand the great density of population in Belgium and the Netherlands, we must have regard also to the **history** of the countries. Though the absolute amount of the commerce of these regions can never have been as large as it is at present, its relative amount was in earlier times even greater. From the thirteenth to the fifteenth century the seaports of **Antwerp** and **Bruges** were the rivals in commerce of Venice and Genoa, and the development of population dates from that period. Commerce stimulated all other branches of industry. Manufactures flourished from the ease with which raw materials could be obtained from abroad, manufactured goods sent away to distant

markets. Supplied with wool from England and elsewhere, Ghent and other cities of Flanders wove immense quantities of cloth at a time when English manufactures were unknown, and to meet the wants of artizans and traders the soil was cultivated with an amount of care which would have been thrown away elsewhere.

This wealth made the possession of the Low Countries or Netherlands an object of desire to many princes, and after frequently changing masters the provinces came into the hands of the kings of Spain about the beginning of the sixteenth century. About that time the Reformation movement began, and the zealous Roman Catholic king of Spain, Philip II., made every effort to prevent the adoption of Protestant principles by the people of the Netherlands. In the end, the northern provinces, which had firmly embraced **Protestantism**, acquired their independence, but the southern provinces were subjected and kept attached to **Roman Catholicism**. Both divisions ultimately became kingdoms, but their present existence as separate kingdoms dates only from 1830.[1]

The **Dutch language** is a Teutonic tongue, more closely allied to English than German is, and a dialect only slightly different (**Flemish**) is spoken by more than half of the inhabitants of Belgium, the remaining half of whom in the south (**Walloons**) speak French.

Elementary **education** is compulsory in both countries; but education generally is more advanced in Holland than in Belgium. In religion the former country is Protestant, the latter Roman Catholic.

Towns and Districts.—1. Belgium. **GHENT** (prov. East Flanders), at one time the residence of the Counts of Flanders, attained the height of its prosperity in the fifteenth century, at which date it was more populous than Paris. Its modern prosperity it owes to cotton manufactures; Ghent containing half of all the Belgian cotton spinneries. **Bruges**, in West Flanders, formerly the port of Ghent, is a declining town, and has now only interesting relics of a past glory. **Ostende**, amidst the downs of the coast, is chiefly noted as a sea-bathing place. **ANTWERP**[2] (227; in 1846, 100; prov. Antwerp) a little above the head of the estuary of the Scheldt, occupies a position nearly as favourable for commerce as London, and is now growing with rapid strides as a seaport. In former days it reached the height of its

[1] The Grand Duchy of Luxemburg is an independent, "perpetually" neutral State, of which the last King of Holland was also the Grand Duke. A Belgian province called Luxemburg lies adjoining.

[2] See Introduction, p. 61 (1) (*a*).

prosperity in the fifteenth and sixteenth centuries, declining in the seventeenth on the rise of the Dutch seaports; but it has now once more outstripped the latter, and become one of the greatest seaports on the mainland of Europe, importing the raw material not only for the manufactories of Belgium, but also to a large extent for those of the middle Rhine basin. It is strongly fortified, and is likewise noted for its fine cathedral and its art treasures. **BRUSSELS** (482) (South Brabant), near the centre of the country, at the meeting of hill and plain, with manufactures of carpets and lace, a town of comparatively modern origin, but now the capital of Belgium. Immediately to the south lies the battlefield of Waterloo. **Louvain**, in the same province, east of Brussels, is the seat of the most flourishing of the Belgian universities. In the fertile province of Hainaut is **Mons**, the neighbourhood of which is crowded with coal-mines and ironworks, and is the most densely inhabited part of Belgium. **LIÈGE**, capital of the eastern province of the same name, on the Meuse, where it begins to turn northwards, is the Belgian Birmingham, and its suburb, **Seraing**, is noted for its machinery and other iron manufactures. **Verviers**, in the same province, has important woollen manufactures.

2. **Netherlands.**—In North Holland, **AMSTERDAM** (417), on the Ij,[1] a branch of the Zuider Zee, the chief commercial town in the country, first acquired importance after the revolt against Philip II. of Spain. The Zuider Zee being too shallow for shipping, a canal was constructed first of all northwards to **Helder**, opposite the island of Texel, but this has recently been superseded by another canal, which proceeds westwards to the North Sea at Ijmuiden,[2] and is capable of being used by the largest ships. The population includes a large proportion of Jews, among whom are many diamond merchants. **Haarlem** (prov North Holland), a few miles west of Amsterdam, is the centre of the flower cultivation of the Netherlands. **Leiden** (South Holland) is the seat of a well-known university,[3] famous in last century for its medical school. **THE HAGUE** (Dutch, 'S Gravenhage, 'The Count's Hedge'), also in South Holland, a few miles to the south-west of Leiden, is the political capital of the country. **ROTTERDAM** (209) (South Holland), south-east of the Hague, on the Maas, still the chief seaport in the Netherlands, having outstripped Amsterdam when that port was not accessible for ships of a large size. **Utrecht**, in the province of the same name, important as a seat of trade and industry, first of all on account of its situation at the point where the Old Rhine[4] and the Vecht[4] diverge, the former the water-way from Germany to Leiden, the latter to Amsterdam; now a railway centre. It is also the seat of a university, and historically is noted as the place where several important treaties were concluded in 1713.

[1] Formerly spelt Y, pronounced like the English letter I.

[2] That is, 'Mouth of the Ij:' *ui* in Dutch is pronounced like *oi* in English.

[3] Founded by William of Orange in 1575 to commemorate the heroism displayed by the inhabitants during the siege which it had just sustained against the Spaniards.

[4] The two most northerly arms of the Rhine, formed by the branching of the Krumme (crooked) Rhine.

GERMANY.

Approximate latitudes: (York), Mouth of Elbe, Lübeck, 54°; (Birmingham), Berlin, 52½°; (Mouth of Loire), southern frontier (Buda-Pest), 47½°.
Approximate longitude: 6° to 23° E.

Germany is an empire in Central Europe, rather larger in area and considerably more populous than France. It is for the most part without natural boundaries[1] in the east and west, but separated in the south from Austria and Switzerland by a series of mountains and the Lake of Constance.

The surface is for the most part mountainous or highland (above 1,000 feet) in the south-west, while in the north and east it is part of the great Central Plain of Europe.

If we begin our description in the south-west we notice first of all a range of mountains, the **Vosges** (Ger. Vogesen), running north and south on the left bank of the Rhine, and now forming part of the Franco-German frontier. On the opposite side of the Rhine, at the point where that river turns to the north, we observe the junction of two mountains or narrow plateaux, one of which runs north, parallel to the Vosges, the other north-east. The former is known as the **Black Forest**, from its covering of dark pines; the latter is a continuation of the Swiss Jura, and in Germany first receives the name of the **Suabian Alps** (in Würtemberg), and afterwards that of the **Franconian Jura** (in Bavaria). The direction of these latter ranges is at first nearly parallel to the course of the Danube, but opposite the bend of that river, where Ratisbon stands, becomes more northerly, the Franconian Jura advancing in that direction nearly to the **Fichtelgebirge**, in the north-east of Bavaria. From the neighbourhood of this somewhat isolated group other three mountain ranges strike off in different directions—one, the **Franconian**[2] and **Thuringian**[3] **Forests**, to the north-west; a second, the **Erzgebirge**,[4] to the north-east; and the third, the **Bohemian Forest**,[5] to the south-east. These mountains may be considered as marking off different regions of the German highlands.

[1] By natural boundaries is meant boundaries formed by some well-marked physical feature, such as seas or mountain chains.
[2] Ger. *Frankenwald*.
[3] Ger. *Thüringerwald*.
[4] Ger.=Ore Mountains.
[5] Ger. *Böhmerwald*

(1) The German Jura, the Bohemian Forest in the east of Bavaria, and the Alps in the south of Bavaria, enclose a triangle consisting mainly of a bleak plateau with considerable stretches of moorland. (2) A second triangle lies to the north-west of the Jura, and is bounded on the other two sides by the Thuringian Forest and a plateau of ancient slates, through the middle of which the Rhine has cut for itself a deep gorge, where it flows from Bingen towards the north-west. This triangle, drained by the **Neckar** and the **Main**, as well as the **Rhine**, is very varied in surface, but its valleys are among the most favoured parts of Germany in respect of soil and climate. Specially favoured is the flat portion of the valley of the Rhine between Mainz [1] in the north and Basel [2] in the south, and between the Black Forest and the Vosges in the east and west. (3) A third triangle looks to the north-east, bounded on two sides by the Thuringian Forest and the Erzgebirge, the latter of which slope gradually towards Germany with parallel undulations, while the third side is formed by the irregular outline of the German plain, which, in the west, begins only at the base of the **Hartz Mountains**, a somewhat isolated range, stretching parallel to the Thuringian Forest, a little to the south of lat. 52° N. This triangle is also very varied in surface, though still mainly highland. The valley of the **Weser** separates this triangle from the slate plateau in the extreme west, a plateau which is itself surmounted here and there by smaller plateaux or mountains. These are in some cases masses of granite, in others, as in the **Eifel**, north of the Moselle, on the left bank of the Rhine, ancient volcanoes like those of the Auvergne region in France.[3] Their craters now form in some cases the basins of small lakes.

Beyond the Erzgebirge, the frontier mountains of Germany again take a south-easterly direction, like the Bohemian Forest, as well as the Thuringian Forest and the Hartz Mountains, and they lie indeed in the same line with the last-mentioned range. The general name of the **Sudetes** is sometimes applied to the whole series; but the north-west section is most usually distinguished by the name of **Riesengebirge**.[4] It is opposite the Sudetes that the German plain spreads out to its widest.

The German **lowlands** are for the most part undulating.

[1] Fr. *Mayence*. [2] Fr. *Bâle*. See p. 238 n. 2. [3] See cut, p. 206. [4] Ger. = Giant Mountains.

Only here and there are there perfectly level tracts. The soil is not in general very fertile, but in the west there occurs near the coast a considerable tract, over which the sea has in former times spread a covering of rich deposits now occupied by corn-fields and meadows. This tract, which is divided up by dykes and canals like the Dutch polders, presents a marked contrast to the more barren and heathy region behind.

The outskirts of the German highlands contain nearly all the important **mineral deposits** of the country. At the foot of the Sudetes in Upper Silesia (Prussia) are found **coal, iron,** and **zinc,** the former of which have made this the seat of a great iron industry, of which **BRESLAU** (335), on the Oder, is the centre. The **Erzgebirge** yield **silver, lead,** and tin; and a rich coal-field at their base has converted this part of Germany into an important manufacturing region, the centre of which is **CHEMNITZ,**[1] the Saxon Manchester (in the kingdom of Saxony). The **Hartz Mountains,** one of the oldest mining districts of Germany, yield metals of all sorts, and the northern slopes of the western plateau furnish nearly inexhaustible supplies of coal and iron, so that this region, favoured also by its situation near the coast, and its easy access to the Rhine, is the most important of all the industrial districts of Germany, and is almost as thickly studded with manufacturing towns as South Lancashire or the south-west of Yorkshire.

The district belongs entirely to the Prussian provinces of the Rhine and Westphalia. The principal towns in it are the twin towns of **BARMEN** and **ELBERFELD,** with manufactures of silk and cotton; **COLOGNE**[2] (281), **DÜSSELDORF** (also famous for its school of painting); **AACHEN,**[3] chief seat of the German woollen manufactures; **KREFELD,** chief seat of the silk manufactures; **Dortmund** and **Essen,** the chief centres of the coal and iron industry of Germany, the latter with the vast iron and steel works of Krupp; **Bonn,** on the Rhine, more celebrated as the birthplace of Beethoven than as a manufacturing town.

Besides the minerals already mentioned, **amber** is still an important product on the eastern shores of the Baltic.[4] **Salt** is obtained in various places; and besides common salt, there are

[1] It is worthy of note, however, that in the kingdom of Saxony the textile and other manufactures are not so much centralised in large towns as in other great industrial regions, but are distributed over a crowd of small towns and villages.

[2] Ger. *Köln,* both forms being corruptions of the first half of the ancient Roman name, *Colonia Agrippina.* It is famous for its cathedral, commenced in 1248, but not completed till 1880.

[3] Better known by the French name of *Aix-la-Chapelle.*

[4] See p. 233.

produced at **Stassfurt**, in Prussian Saxony, great quantities of potash salts, which form a valuable manure.

In other parts of Germany the people are chiefly engaged in **agriculture** and **cattle-rearing**. The chief crops are **rye**, **potatoes**, and **sugar-beet**.[1] In the warmer valleys lying amidst the highlands of Central Germany, **fruit** and **wine** become important products, but more fruit than wine is grown; while further to the south-west, and especially on the hills looking down on the Rhine and its tributaries, the Neckar and the Main, wine is the staple production, and **tobacco**, **maize**, and **hops** also attain importance.

Forests cover one-fourth of the entire surface, and in ancient times all Central Europe appears to have been, like Britain, chiefly an area of woodland and marshes.

The **rivers** of Germany, all of which, except the Danube and its tributaries, drain into the German Ocean and the Baltic, are of great value as highways of commerce, and hence have an exceptionally large number of important towns on or near their banks. The **Rhine**, the **Elbe**, the **Oder**, and the **Vistula** are navigable for all or nearly all that part of their course which lies within the German frontier. The first two, both broad and deep rivers, are specially important, and still carry enormous quantities of merchandise, notwithstanding the development of railways, and the banks of the Rhine are studded with a larger number of important towns than those of any other river in Europe.

In the **commerce** of Germany **wool** takes an important place among the **imports**, as among those of France, and the same two countries, the Argentine Republic and Australia, are the principal sources of the supply. Along with **wool**, **grain** and **raw cotton** are the **chief imports**, and **woollen** and **silk manufactures** together with **sugar** form the **chief exports**.

The **population** of Germany is rapidly increasing, notwithstanding a rapid emigration, especially to the United States and Australia. Its average density is upwards of 236 to the square mile.[2] The majority speak **German** dialects, but in the east

[1] A plant allied to mangold, with a thick tapering root, the chief source of sugar on the mainland of Europe.

[2] The densest population is in the kingdom of Saxony (where the density exceeds 600 to the square mile) and in the industrial region of the west. Comp. p. 216, *n.* 1.

(Prussian province of Posen, and parts of the provinces of West Prussia and Silesia) the people are chiefly Poles, a Slavonic people. At one time Slavs extended much farther west. The migrations of German tribes which broke up the Roman empire in the fourth and fifth centuries were largely due to the pressure of Slavs in the east, and gradually the Slavs advanced as far as the Elbe and the Saale (the middle of Germany). By degrees they were driven back, and those who were left for the most part Germanized. The German-speaking tribes then became the leading power in Central Europe. A German Empire, consisting of a large number of feudal states, embraced not only the greater part of the present Empire, but, at the height of its power, also Bohemia, Moravia, the entire domain of the Alps, the north of Italy, the Burgundian plain in the basin of the Rhone and Saône, Belgium, and the Netherlands. The supreme ruler claimed to be the successor of the Roman emperors, and, being crowned by the popes, called his dominion the **Holy Roman Empire**. From the sixteenth century, in consequence of the wars between Roman Catholics and Protestants after the Reformation, the power of the emperors rapidly diminished, the different states becoming more and more independent, and during the Napoleonic wars the empire ceased to exist even in name. A confederacy was then formed, of which Austria was a member; but Austria was expelled in 1866 after a war with Prussia, which henceforth became the leading state. The present German empire, comprising twenty-five independent states, besides the Imperial territory of Alsace-Lorraine,[1] was constituted in 1871 during the continuance of the Franco-German war.

The following table shows the principal members of the German Empire:—

Kingdoms	Area in thousands of sq. miles	Pop. in millions (1891)
Prussia	134	29·9
Bavaria	29	5·5
Saxony	5·8	3·5
Würtemberg	7·5	2·0
Imperial Territory		
Alsace-Lorraine	5·6	1·6

Grand-duchies	Area in thousands of sq. miles	Pop. in millions (1891)
Baden	5·8	1·6
Hesse-Darmstadt	3	1
Mecklenburg-Schwerin	5	0·6
Mecklenburg-Strelitz	1	0·1
Saxe-Weimar	1·4	0·3
Oldenburg	2·5	0·3

[1] Ger. *Elsass-Lothringen*, but generally known in this country by the French name on account of the long connection of the provinces with France, from which

There are in addition five **duchies**[1] and seven **principalities**, with an average area about equal to that of Maryland, besides the three **cities**[2] of Hamburg, Bremen, and Lübeck, which have a republican form of government.

The position of these states can be learned only from the map; but it may be noted that Prussia extends (with interruptions) along the whole length of North Germany; in South Germany between France and Austria, Alsace-Lorraine, Baden, Würtemberg, and Bavaria, succeed one another from west to east, and Saxony lies to the south of Central Prussia. The kingdom of Prussia is divided into twelve provinces, most of which are of about the size of the State of Maryland.

Three-fifths of the inhabitants of the empire are **Protestants**, scarcely two-fifths (chiefly in the east and south-west) **Roman Catholics**. **Education** is very widely diffused and highly advanced. There are twenty-one **universities**, the chief of which are at **Berlin**, **Leipzig**, and **Munich**.

Towns.—1. **Seaports.**—On the coast of the German Ocean, where a line of downs, fringed by small islands (the Frisian Islands), separated from the coast by a sea so shallow[3] that several of them can be reached on foot at low tide, forms a continuation of the coast-line of Holland, the only seaports are at the mouths of the rivers.

On the Weser stands **BREMEN**, at the head of navigation for sea-going ships, but no longer accessible for ships of large burden,[4] on which account **Bremerhaven**, at the mouth of the estuary, was founded by the city on land purchased in 1827 from Hanover, which has itself founded the contiguous seaport of **Geestemünde**; **HAMBURG** (324; pop. of the entire state, 622), at the head of the estuary of the Elbe, is still accessible, with the aid of the flood-tide (which rises on an average above 6 feet), for the largest sea-going vessels, and is the chief seaport in Germany. This pre-eminence it owes not only to its commerce with the eastern ports of Britain and North America, but also to the fact that it stands at the mouth of a river which is navigable

they were acquired by Germany only at the conclusion of the Franco-German war in 1871. It is directly under the Imperial government.

[1] Brunswick, Saxe-Meiningen, Saxe-Coburg-Gotha, Saxe-Altenburg, Anhalt.

[2] Often called the Hanse Towns, and until quite recently the *free cities*, as being the last independent survivors of the *Hansa*, a league of trading towns formed in the Middle Ages for mutual protection. The league had a depôt in London which was long known as the Steelyard.

[3] The so-called *Watten*.

[4] See Introd. p. 61 (1) (*c*).

even into the heart of Bohemia. The contiguous port of **Altona** is in the Prussian province of Schleswig-Holstein. **Cuxhaven**, a port belonging to Hamburg, at the mouth of the estuary, is naturally of less importance to Hamburg than Bremerhaven to Bremen, though useful, especially in winter. **Tonning**, at the western end of the **Eider Canal**,[1] which affords a passage for small seagoing ships between the German Ocean and the Baltic, is a small town but a seaport of rising importance, in consequence of its exports to Britain of sheep and cattle. The inlet in the north of the duchy of Oldenburg, known as the Jahde, due to an irruption of the sea in the Middle Ages, was purchased in 1823 by Prussia, which at great cost established here the naval station of **Wilhelmshaven**, the only German naval station the waters of which do not freeze in winter.[2]

The east coast of Schleswig-Holstein presents a complete contrast to that of the west, having a large number of beautiful creeks, forming admirable natural harbours, only one or two of which, however, have anything but local importance.

Kiel (Prussia), having the finest natural harbour on the German shores of the Baltic, is the principal station of the German navy, and a place of considerable trade. **Lübeck**, at the head of the next bay to the south-east, was in the Middle Ages, before the extension of German civilisation to the seaports in the east of the Baltic, and before the discovery of America gave greater importance to the seaports communicating more directly with the Atlantic, one of the leading seaports in Europe, for some time at the head of the Hansa, but is now only of local consequence through its Baltic trade.

Wismar (Mecklenburg-Schwerin) is still more decayed, and **STETTIN** (Prus. prov. Pomerania), at the mouth of the Oder, is the next important seaport. **Swinemünde**, on the island of Usedom, has the same relation to Stettin as Cuxhaven to Hamburg, and is, besides, a fortified naval station of the German Empire. On the low, flat coast[3] bordering the sterile strip of Eastern Pomerania, there are no seaports of consequence; but in the provinces of East and West Prussia there are three ports, Danzig, Königsberg, and Memel, all of which carry on a large export trade in the products of the land behind them (timber, grain, flax, and hemp). **DANZIG** (prov. of West Prussia) stands at the mouth of a small branch of the Vistula, which diverges to the Gulf of Danzig, instead of entering the shallow lagoon called the **Frisches Haff**, which is separated from the gulf by a long, low sand-spit. **KÖNIGSBERG** (Eastern Prussia), at the mouth of the Pregel, at the eastern extremity of the Haff just mentioned, owes its rise to an inroad of the sea, which effected a communication with the Baltic at this part. It is the seat of a university at which the philosopher Kant was a professor. **Memel**

[1] Another canal to admit the largest vessels is being constructed from the mouth of the Elbe to Kiel Bay, and will supersede the Eider Canal.

[2] The comparatively fresh waters of the Baltic freeze very readily, see p. 186. Helgoland, recently acquired from England, is being made into a strong fortress and naval station for the defence of the entrances to the Elbe and Weser.

[3] See Introd. p. 48.

stands at the northern extremity of the **Kurisches Haff**, which is even shallower than the **Frisches Haff**, and hence inaccessible to sea-going vessels.

2. Inland Towns of the Plain.—The most important of these is **BERLIN** (Prussian province of Brandenburg), capital of Prussia and the German Empire, on the insignificant river **Spree**, which communicates with the Elbe, partly by means of artificial channels.

Situated in the midst of an unfruitful, sandy district, it owes its importance solely to the fact of its lying in the centre of the German plain, which made it a convenient spot to select as the capital of the power which acquired predominance in that plain.[1] This fact has likewise promoted the development of its trade, and manufacturing industry (above all, the making of machines) has naturally been added. Its population is now upwards of 1,579,000. About 20 miles to the west is the garrison town of **Potsdam**, with the summer palaces of the Prussian kings.

Posen (prov. Posen), a flourishing commercial town on the Warta (trib. Oder), almost due east of Berlin, likewise owes its rise to its central situation. South of Posen, **BRESLAU** (335), chief town of Silesia, not only the seat of a great iron industry (see above p. 222), but also of various other manufactures and the chief market for Silesian wool and zinc. **MAGDEBURG** (202) (prov. Saxony), south-west of Berlin on the Elbe, where some harder rocks rise above the plain to form the banks of the river, and where accordingly the river was easily bridged;[2] hence an important place both in war and commerce. It also lies at the westernmost point of a long reach of the river which divides a fertile tract on the west from barren sands in the east, and as the former is the chief district in Germany for the growth of sugar-beet, Magdeburg is the centre of the German manufacture of sugar.[3] In 1631 the town was cruelly sacked by the soldiers of Tilly the Imperialist general, and its military importance is still recognised by the fact of its being the only place in the centre of Germany the fortifications of which are maintained. West-north-west of Magdeburg is situated **HANOVER** (prov. Hanover), on the Leine, where it begins to be navigable, the residence of the former kings of Hanover, and now important as the centre of the Hanoverian railway system.

All the towns of the plain hitherto mentioned are now in the kingdom of Prussia, but there are two large towns in the kingdom of Saxony[4] in this part of Germany, one, **DRESDEN** (276), the capital, celebrated for the beauty of its situation, its art treasures, and its mild

[1] See Introd. p. 61 (3) (*a*). [2] See Introd. p. 61 (2) (*c*). [3] See p. 223, *n.* 1.

[4] This kingdom was formerly known as an electorate, because in the days of the old German empire the ruler of Saxony was one of the seven princes who elected the emperor. The merino sheep (see p. 267) having been introduced into this electorate about the middle of the eighteenth century and reared there with great care, 'electoral wool,' as it is still called, has attained the reputation of being the best 'clothing wool' in Europe, and indeed in the world, though it has a rival in Silesian (Prussian) wool, and occasionally in Bohemian (Austrian) wool.

climate, all of which make it a favourite place of residence for men of means (including many English). It is also noted as the centre from which one may visit the scenery of the so-called **Saxon Switzerland**, where the Elbe breaks through the mountains at the end of the Erzgebirge amidst fantastically weathered sandstone rocks.[1] The second of the Saxon cities is **LEIPZIG** (353), in a rich plain at the meeting-place of two great high-roads,[2] the one from Frankfurt and the Main valley across the Franconian forest, the other from Bohemia. Hence from an early period the city has been a great seat of trade, largely conducted at periodical fairs, which are kept up to this day, being held twice a year. Furs and woollen goods are the staple articles of trade, and at the Easter fair an immense book-market is opened, Leipzig being the centre of the German book-trade. Since the creation of the present German Empire it has been made the seat of the supreme courts of law.

BRUNSWICK,[3] the capital of the duchy of the same name, is also a flourishing town. The Duchy, like the adjoining Prussian province of Saxony, is a great seat of the cultivation of sugar-beet, and the town of Brunswick, like that of Magdeburg, a centre of the sugar industry, as well as of various manufactures.

3. **Towns of the Highlands.**—On the north-west of the German highlands are the industrial towns of the Prussian provinces of the Rhine already mentioned. On the Main **FRANKFURT** (Pruss. prov. of Hesse-Nassau), formerly a free town, but annexed in 1866 to Prussia, still one of the chief seats of banking and exchange in Germany, but chiefly celebrated as the birthplace of Goethe, the greatest of German poets. Near the left bank of the Rhine, **STRASSBURG**, the chief town of the Imperial territory of Alsace-Lorraine, the seat of a university very liberally endowed since the province in which it lies was acquired by Germany. Further south **Mülhausen**,[4] the centre of a busy cotton manufacturing district. In the valley between the Black Forest and the Suabian Alps **STUTTGART**, on the Neckar, capital of the kingdom of Würtemberg, a rapidly growing town, another important seat of the German book-trade. In the middle of the southern plateau **MUNICH**[5] (348), capital of the kingdom of Bavaria, on the Isar, the largest town in South Germany, with a famous university and polytechnicum, and rich art treasures. West-north-west **Augsburg**, on the Lech, formerly a place of great commercial importance on account of its situation at the meeting of the roads leading across the Alps by the Splügen and Brenner Passes, and at the head of the marshes which border the lower Lech.[6] **Ulm**, in Würtemberg, at the point where the road across the Suabian Alps from the Neckar valley joins the Danube, and where this river begins to be navigable for vessels of 100 tons, has had a similar history. **Ratisbon** (Ger. Regensburg), in Bavaria, near the northernmost point of the Danube, where it begins to be navigable for steamers, is likewise a town of great historical importance. In northern Bavaria (Franconia), **NÜRNBERG**, an old and antique-looking

[1] See cut, p. 230. [2] See Introd. p. 61 (3). [3] Ger. *Braunschweig.*
[4] Fr. *Mulhouse.* [5] Ger. *München.*
[6] Were it not for these marshes the town would naturally have grown up at the confluence of the Lech and Danube. See Introd. p. 61 (2) (*a*) and (3).

town celebrated for its manufacture of and trade in wooden toys, the material for which is obtained from the Black Forest. The small mining town of **Eisleben** at the eastern end of the Hartz Mountains (Prus. prov. Saxony) is memorable as the birthplace of Luther. Along the northern skirts of the Thuringian Forest, among the small states known as the Thuringian States, **Eisenach, Gotha, Erfurt,** and **Weimar** (the last the home of Goethe for the greater part of his life) succeed one another from west to east at the distance of from fifteen to twenty miles. Erfurt is in the Prussian province of Saxony.

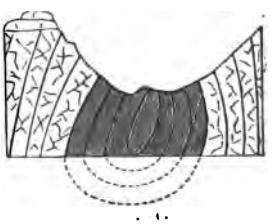
THE ALPS.

Approximate latitude: (Mount Katahdin), Mont Blanc, 46° N.; longitude, 7° E.

The Alps are, beyond comparison, the most important mountain system in Europe. They do not cover the largest area, for both the highlands of Scandinavia and the Ural Mountains have a greater extent, but they contain the highest peaks, have the greatest average elevation, and, what is most important, instead of being situated in a thinly populated region, lie between countries in which the population is dense, and has long been highly civilised.

The mountains belonging to this system sweep round the west and north of Italy, and spread out to the east in a number of nearly parallel chains in Austria. In consequence of this curved form, and the great breadth which in some places the system attains, the inner margin is much shorter than the outer, in round numbers 460 as against 800 miles. The slope on the inner side (towards Italy) is much more rapid than on the outer, and hence the appearance of the Alps as seen from Milan is much more imposing than when seen from Bern.

The structure of these mountains as illustrated in the accompanying figure (fig. 40) showing how in the valley of Chamounix below Mont Blanc the strata have been folded between masses of gneiss and granite, proves that the forces to which they owe their elevation have been extraordinarily violent in their action. The greater steepness of the slope on the inner side indicates that on this side there has been most resistance to the crushing force that led to their folding and elevation.[1]



In the broader (east to west) part of the system, the mountains can be divided according to the nature of the rocks of

[1] See Introd. p. 34.

FIG. 41.—SCENE IN THE 'SAXON SWITZERLAND.' See p. 228.

which they are composed into **three zones**, succeeding each other from north to south. The middle zone consists of granite and other crystalline rocks,[1] which form the core of the system; while in the outer zones various limestones predominate, so that these parts of the system have been called the **Limestone Alps.** On the north the limestone zone extends farther west than on the south or inner side, where in the west the limestone zone is wanting, crystalline mountains descending right down to the plains of Italy. On this side the limestone zone begins only on the east of the Lago Maggiore in the form of a very narrow fringe, which spreads out to the east.

The narrowest part of the system is that which runs from north to south, between Italy and France, and in this part the principal valleys are those which, traversed by the **Durance** and **Isère**, wind in numerous zig-zags to the valley of the Rhone. The system suddenly increases greatly in breadth where it turns eastwards, and here we begin to meet with its most striking features—its loftiest peaks, its snow-fields, glaciers,[2] and waterfalls, its parallel chains with intervening longitudinal valleys[3] traversed by important rivers, (the Rhone, Rhine, Inn, Enns, Drave, &c.), and sometimes occupied by large and beautiful lakes.[4] All of these longitudinal valleys open on the outer side of the curve described by the whole system, but some of the transverse valleys on the inner side are occupied by lakes of even greater beauty.[5] The most important of the longitudinal valleys is that of the Upper Rhone, between the Bernese Alps on the north and the Alps of Valais on the south, and into it descends from the former chain the largest of the Swiss glaciers, the **Aletsch.** The chains that bound this valley contain the highest peaks of the whole system, several on both sides rising to above 14,000 feet in height, and two (both in the south) to above 15,000 feet. One of these, **Mont Blanc**, in the French department of Upper Savoy, at the angle where the general direction of the mountain system becomes east and west instead of north and south, attains

[1] Crystalline rocks are composed of small particles or fragments of particles of a definite and regular form. Most rocks due to the action of heat are crystalline, and crystalline rocks are generally hard. [2] See Introd. p. 58.

[3] *Longitudinal* valleys are valleys separating parallel mountain chains, those which run at right angles to the general direction of a chain being called *transverse* valleys. [4] See Switzerland, p. 237. [5] See Italy, p. 269.

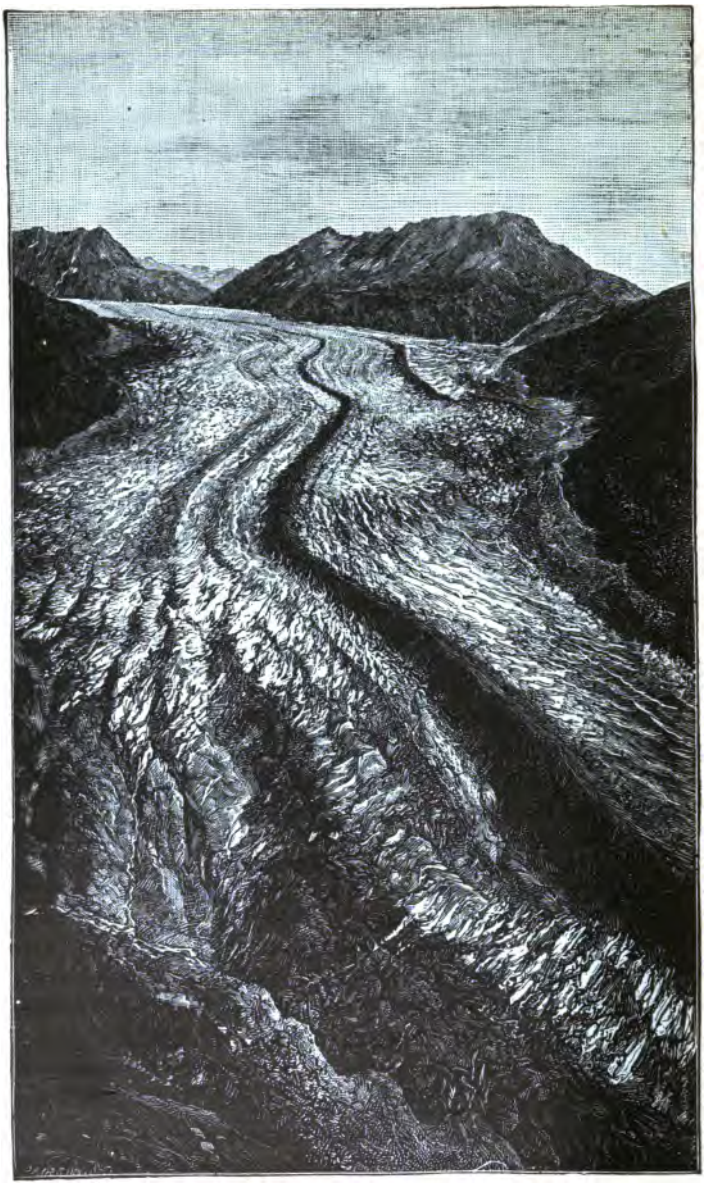


FIG. 42 —THE ALETSCH GLACIER.

the height of 15,800 feet, or not far short of three miles. The other is **Monte Rosa** situated to the east of Mont Blanc on the Italian and Swiss frontier.[1]

It is one of the most noteworthy features of the whole system that the peaks rise to a great height above the general elevation of the mountain chains, and that there are numerous deep notches or passes led up to by gradual ascents on both sides, enabling commercial intercourse to be carried on across the mountains. Hence, from an early period, these mountains have not acted as a barrier to communication so much as might be expected from their extent and elevation. Even in ancient Roman times one of the great routes of trade was that by which amber was conveyed from the east shores of the Baltic across the Eastern Alps, where the passes are lowest. In this part of the system there are scarcely any important passes above 5,500 feet in height, while in the Middle Alps, from the sources of the Adige to Mont Blanc, there are few under 6,500 feet, and the principal passes in the Western Alps are also above that height. In many places the passes have to be protected by galleries (archways with openings for light on one side) against **avalanches.**[2]

The **chief passes** are: (1) in the **Western Alps**, the part of the system running mainly north and south—(*a*) the **Col di Tenda**, across the Maritime Alps, between the south-east of France and the south-west of Sardinia. (*b*) The **Mont Cenis Pass**, between the Isère valley (with the fortress of Grenoble) and the valley of the Dora Riparia (a tributary of the Po leading direct to Turin), in the Middle Ages the most frequented of all the passes of the Western Alps. (2) In the **Middle Alps**, between Mont Blanc and the valley of the Adige (Ger. Etsch)—(*a*) the **Great St. Bernard Pass**, between the valley of the Rhone and the north-west of Italy (Aosta on the Dora Baltea, a tributary of the Po), only a bridle-path. (*b*) The **Simplon Pass**, a much more important pass, now crossed by a fine carriage-way, between the Rhone valley and the valley opening on the west side of the Lago Maggiore. (*c*) The **St. Gothard Pass**, another carriage road, between the valleys of the Reuss (head of Bay of Uri) and Ticino. (*d*) The **Splügen Pass**, between the valley of the Hinter-Rhine (in which the road passes through the fearful gorge of the Via Mala) and the valley leading down to the Lake of Como. (*e*) The **Maloja Pass**, between the head of the valley of the Inn (East Switzerland) and another valley leading down to the same lake. (*f*) The **Furca Pass**, between the head of the Rhone valley and that of the valley of the Reuss—the most important of all the passes connecting

[1] See section across Europe, p. 63.

[2] An *avalanche* is a fall of a mass of snow, and often works great destruction. The mere agitation of the air caused by an avalanche has been known to uproot trees.

longitudinal valleys. (3) **In the Eastern Division**: (*a*) the **Brenner Pass** connecting the two great valleys of Tyrol, that of the Adige in the south (with the town of Trent) and that of the Inn in the north, where the road leading from the pass crosses the Inn at Innsbruck.[1] (*b*) The **Semmering Pass**, between Lower Austria and Styria, on the route from Vienna to Trieste. The Mont Cenis, St. Gothard, Brenner, and Semmering Passes are now largely superseded by railways piercing the Alps by tunnels. The Mont Cenis tunnel, however, lies fifteen miles to the south-west of the pass from which it takes its name. The St. Gothard tunnel is the longest in the world—nearly ten miles in length.

Though lying between two populous regions, the Alps themselves are necessarily thinly populated. The **principal occupation of the people is rearing of cattle**, for which the rich pastures, nourished by the plentiful rains characteristic of mountainous regions,[2] and the moisture derived from the melting snows, afford abundant food. The limit in height of permanent habitation is about 6,000 feet, this being also the limit of forests, which serve as a protection not only against avalanches but also against the washing away of the soil by torrents and torrential rains. The zone between 2,000 and 6,000 feet in height is known as the **Fore-alps**. From 6,000 feet to the snow-line,[3] about 9,000 feet (rather higher on the southern slopes), is the zone of the **alps** in a special sense—that is, mountain pastures grazed by cattle in summer, pastures on which the only woody growths are crooked and stunted pines and a few shrubs, above all the beautiful Alpine roses (rhododendrons). This is the zone of the châlets or summer-huts of the Alpine herdsmen. The highest zone of all is that of **perpetual snow**, and the scene from one of the higher peaks overlooking this zone is very different from what might be expected from the aspect presented to spectators at the base. Instead of a continuous line of peaks one sees a broad plateau rising everywhere into billowy crests, all snow-wrapt, or only here and there exhibiting a surface of naked rock.

SWITZERLAND.

Approximate latitude: middle point, 47° N.; longitude, 8¼° E.

Switzerland occupies the heart of Europe. Its area is about twice that of Massachusetts, and its population nearly three millions. Altogether about five-sevenths of the surface

[1] Ger.=Inn-bridge. [2] See Introd. p. 52 (3) (*a*). [3] See Introd. p. 53.

is divided between the Alps, in the south and east, and the Jura in the north-west, while the remainder forms a plain or rather a hill-studded plateau stretching north-east from the **Lake of Geneva** to **Lake Constance** (German, Bodensee). The length of the plateau, which contains most of the agricultural land and the majority of the population of Switzerland, is about 100 miles, and its average breadth from twelve to twenty miles.

Of the surface occupied by mountains the part belonging to the Alps is four times as great as that belonging to the **Jura.** The latter consists of a series of nearly parallel mountain chains, which begin in the south-west (in France, where they have their highest peaks), and extend north-eastwards along the north-west borders of Switzerland into Germany, the average height of their crest gradually diminishing from about 4,000 to 2,000 feet. They are mostly composed of a light-coloured limestone,[1] in which there are numerous caverns, and in which the streams often disappear into underground channels.[2] Unlike the Alps, they have few peaks rising very far above the general height of the crest, and few transverse valleys.[3] The longitudinal valleys are bleak, high-lying depressions. The Jura Mountains agree with the Alps in having the more gradual slope to the north-west (the outside of the curve), so that the more abrupt descent in this case is towards the Swiss plateau.

Since the Alps form the great water-parting of Western Europe,[4] the **rivers** of Switzerland flow outwards in all directions—the **Rhine** to the German Ocean, the **Rhone** to the Gulf of Lions (west of Italy), **tributaries of the Po** and **Adige** to the Adriatic, the **Inn** to the Danube, and hence to the Black Sea. Almost all the Swiss rivers are too impetuous for navigation except by small craft, but they are much used for floating timber from the mountains. The **Aar**, the Rhine tributary which traverses the plateau, becomes navigable on leaving Lake Thun. About midway

[1] The limestone of the Alps is generally of a dark colour.

[2] 'No whisper, nor murmur, nor patter, nor song of streamlet disturbs the enchanted silence of open Jura. The rain-cloud clasps her cliffs, and floats along her fields; it passes, and in an hour the rocks are dry and only beads of dew left in the Alchemilla leaves,—but of rivulet or brook,—no vestige, yesterday, or to-day, or to-morrow. Through unseen fissures and filmy crannies the waters of cliff and plain have alike vanished, only far down in the depths of the main valley glides the strong river unconscious of change.'—RUSKIN. See Introd. p. 29.

[3] See p. 231 n. 3.

[4] See p. 183.

FIG. 43.—THE LAKE OF GENEVA.

between that lake and the Rhine it is led by an artificial channel into the **Lake of Bienne**, so as to protect the lower part of its course from inundations.[1] The numerous **lakes**, partly on the north of the Alps (**Geneva, Brienz,** and **Thun**; **Lucerne, Zürich, Wallenstadt, Constance,** &c.), partly on the plateau (**Neuchâtel** and **Bienne**), are important as means of inland communication, while those of the Alps are all celebrated for the beauty of the surrounding scenery.

Besides the crops grown in England, Switzerland produces in the warmer parts **maize, wine,** and **tobacco.** The **vine** flourishes even to the height of 2,000 feet, and is grown principally in the south-west and the north-east (round the Lakes of Geneva and Zürich). The products of the pastures are more important than those of the fields and vineyards, and **cheese** forms a large export,[2] an export that is increasing at the expense of field produce, since the railways of modern times are giving increased value to the products of the Swiss mountain pastures, and making it increasingly easy for Switzerland to obtain supplies of grain from abroad. But with an average population of 180 to the square mile, and nearly a third of the area unproductive, the soil of Switzerland alone is unable to sustain the inhabitants, and great quantities of **grain and other agricultural produce** have to be **imported.** This import is balanced chiefly by an **export of manufactured goods,** Switzerland, notwithstanding its scarcity of minerals, and in particular of coal and iron, having a high place among the manufacturing countries of Europe.

For such industries, it has two advantages to place against its disadvantages: (1) the water-power of the Alps, which is more largely utilised in Switzerland than elsewhere; (2) its central position between populous and highly civilised countries. The chief manufacturing industries are **cotton** (in the north-east), and **silk** (in Zürich and Basel). **Watchmaking** is an important handicraft in the Jura, and Geneva is the centre of the Swiss trade in watches.

The divisions of Switzerland, 22 in number, are known as **cantons,** the largest of which, the **Grisons,** is about one-third the size of Massachusetts. Though none of them has a single town with 100,000 inhabitants, they are all, to a certain extent, independent states, managing their own local affairs as

[1] See Introd. p. 31.

[2] Gruyère cheese is made in the canton of Freiburg, in western Switzerland.

[3] See also on education, p. 238.

little republics,[1] but all uniting to form a **Confederacy** for the regulation of affairs common to the whole. The Confederacy, as it now exists, originated in the present century, and the different cantons composing it had a different history, as they still differ in **language, religion,** and culture. **German** is spoken by more than two-thirds of the people, **French** by almost one-fifth (chiefly in the south-west), **Italian** in Ticino and some other southern valleys, and in the south-east a few thousands speak **Rumonsh,** a language peculiar to the locality, an independent descendant of the Latin. About three-fifths of the entire population are **Protestants,** the remainder **Roman Catholics,** the latter inhabiting chiefly the more mountainous cantons.

The northern and western cantons are most advanced in culture, and the encouragement given chiefly through their influence to education (which is obligatory to a certain extent in all cantons) is one of the chief causes that have enabled this little country to triumph over the obstacles to the development of manufacturing industry within her borders. There are four universities; and at Zürich there is one of the best-equipped technical schools in Europe—a school in which students are taught everything connected with manufactures, as well as agriculture, forestry, building, and engineering.

Chief Towns.—There are only three with more than 50,000 (including suburbs). **Zürich,** the intellectual and commercial centre of German Switzerland, is situated at the lower end of the lake of the same name, its suburbs extending for several miles along both shores of the lake. Its commercial importance is largely due to the fact that it is the first considerable town in Switzerland both on the road and railway through the heart of the country by way of the St. Gothard to the south, and on the road across the Splügen Pass farther east. **Basel,**[2] at the bend of the Rhine[3] and the head of the fertile valley lying between the Vosges and the Black Forest, has been a place of consequence since the time of the Romans, and is noted for its manufacture of silk ribbons. **Geneva,** at the south-west end of the lake of the same name, at the point where the Alps and Jura almost meet, is the intellectual centre of French Switzerland, and a favourite place of residence for strangers. In the early part of the sixteenth century it was the residence of Calvin, the founder of one of the chief Protestant sects of the Continent, and was then practically under his sway. **Bern,** on the Aar, has been chosen as the seat of the legislature of the Confederacy, chiefly on account of its central position. The seat of the supreme courts of law is **Lausanne,** on the north shore of the Lake

[1] Only one, Neuchâtel (Ger. = Neuenburg, both names meaning New Castle), formerly had a monarchical form of government, being subject to the King of Prussia.

[2] A German-speaking town, but more familiarly known by its French name of Bâle.

[3] See Introd. p. 61 (2) (*b*).

of Geneva. **Lucerne**, at the lower end of the lake of the same name, and **Interlaken**,[1] on the plain between the Lakes of Thun and Brienz, though both small places, are well known throughout the western world as the head-quarters of the numerous visitors who make the mountains of Switzerland their holiday-ground. Of these there are known to have been nearly a million and a half in a single year. Within sight of Lucerne, on the shores of the lake, is the **Rigi**, a mountain ascended by crowds of tourists for the sake of the magnificent views which its summit commands. Its top can now be reached by railway.

AUSTRIA-HUNGARY.

Approximate latitudes: (south-west extremity of England), Prague, Cracow, 50°; (Munich), Vienna, 48°; (Lyon, Milan), Trieste, 46°.
Approximate longitude: 10° to 26° E.

Austria-Hungary is the second in size and the third in population among the great states of Europe. Of all these it is that which has the smallest length of coast-line. The **coasts** are almost everywhere steep and rocky. Opposite Dalmatia, the long strip on the east of the Adriatic, is a row of rocky islands, the northernmost of which form the eastern boundary of the stormy Gulf of Quarnero (with the seaport of Fiume). On the other side of the peninsula of Istria is the more sheltered Gulf of Trieste, with the much more important port of Trieste at its head.

In most parts Austria-Hungary is without natural boundaries. The **surface** is composed of extensive mountainous areas, extensive plateaux, and extensive plains, the last lying in the interior. In the west, the chief mountain area is that of the **Alps**, which in the south are connected by a series of arid limestone plateaux with the Dinaric Alps and the mountains of the Balkan Peninsula. With the exception of the **Hohe Tauern**, the central range of the Alps beginning immediately to the east of the Brenner Pass, a range in which the chief peaks rise to upwards of 12,000 feet, all the Austrian Alps can easily be crossed at almost any part. All the important streams from these western and south-western mountains flow down to the right bank of the Danube.

On the opposite bank of the Danube lies in the first place a **series of mountain-girt plateaux** embracing Bohemia, Moravia, Austrian Silesia, and parts of Upper and Lower Austria. On the **east** of this highland area a relative depression of about 1,000 feet in height, known as the **Moravian Gate**, separates the Sudetes[2]

[1] 'Between the lakes.' [2] See p. 221.

from the Carpathians and forms an important line of communication between north and south in this part of Europe. It leads along the valley of the **Morava** directly down to the point where the Danube valley, the great line of communication between the east and west, begins to open out into the plain of Upper Hungary. The slope of this series of plateaux is different in different parts. The west (Bohemia) is drained northwards by the **Moldau** and **Elbe**, the east chiefly southwards by the **March** or **Morava**.

East of the Moravian Gate the **Carpathian Mountains** sweep round in a semicircle of about 1,000 miles in length from the north to the east of Hungary, and both in the north and east have on the interior parallel ranges or tortuous spurs extending for a great distance into the plain. In the north the inner range, called the **Tatra**, is the loftiest and most rugged part of the whole system, the mountain sides being mostly too precipitous for the accumulation of perpetual snow or glaciers. The eastern assemblage of mountains forms the province of **Transylvania**. The narrower and lower connecting portion in the middle (in the north-east of Hungary) is known as the **Forest Carpathians**.

The great **plains** of the empire lie chiefly to the east of the Danube (in the area watered by the **Theiss** and its tributaries) and along the banks of the **Drave** (Drau [1]) and **Save**, the chief tributaries of the Danube on the right bank. The former area, one almost unbroken plain of about the size of Indiana, is the region of the Hungarian **pusstas**, a region which is in winter a succession of morasses or storm-swept snow-wastes, in spring a carpet of green, in summer a scorched and withered desert. Permanent morasses of great breadth border the Theiss and its tributaries.[2] The principal occupation of the people in this region is cattle-rearing, and the rods and poles of the wells for the cattle are in many places the most conspicuous features in the landscape by day, as the fires of the shepherds are by night.[3] But there are also large areas fit for agriculture, and above all in the district known as the **Banat**, the square enclosed by the Maros, Theiss, Danube, and the mountains of Transylvania, a region covered with a rich soil which brings forth the most abundant crops of **wheat** and **maize**, together with those of a more southerly climate (**cotton, rice**).

[1] The German name. [2] See p. 28. [3] See cut, p. 242; also p. 52.

The wide low-lying valleys of the Drave and Save bring forth luxuriant crops of wheat and maize as well as good wine.

Outside the Carpathians is the plateau of Galicia and Bukovina,[1] drained partly by the Vistula and its tributaries, partly by affluents of the Dniester (average height 1,000 feet).

From the structure just described it will be seen that by far the greater portion of the Austro-Hungarian Empire is drained by the **Danube**, which being navigable for steamers throughout its course within the Austrian dominions is an important channel of trade. The chief tributaries are likewise navigable for steamers for a large part of their course.

The principal **lakes** of the Austrian Empire are Lake **Balaton** (German Platten-see[2]) and the **Neusiedler-see**, in the west of Hungary, the former among the hills to the west of the Danube, where it flows from north to south, the latter in the plain of Upper Hungary south of the Danube.

Austria-Hungary is **mainly an agricultural state.** About three-fourths of the people are dependent on agriculture, and, though the methods of cultivation are not very advanced, **grain** (more especially **wheat**) is an important article of export in all ordinary years. **Fruit** and **wine** are likewise abundantly produced. **Manufacturing industries** are relatively insignificant except in Vienna and the north-west strip (from Bohemia to beyond Cracow), where the presence of coal and iron furnishes the means of carrying on manufactures on a large scale. Among the **mineral products** are the precious metals (in the production of which Austria-Hungary is surpassed only by Russia among European states), and salt. In the north of Hungary **opals** are obtained.

The **commerce** of Austria by sea is almost confined to the Mediterranean.

None of the great states of Europe is more diverse in **race** and **language** than Austria-Hungary. The people in the west are chiefly of **German** origin and speak the German language; but elsewhere the majority of the people are **Slavs**. The ruling race in Hungary is that of the **Magyars**[3] (whose language still survives), and in the east of the empire the Jews form an influential and rapidly increasing element of the population, having

[1] 'Land of Beeches,' so called from the immense extent of its beech forests.
[2] *See* is German for lake.
[3] See p. 188.

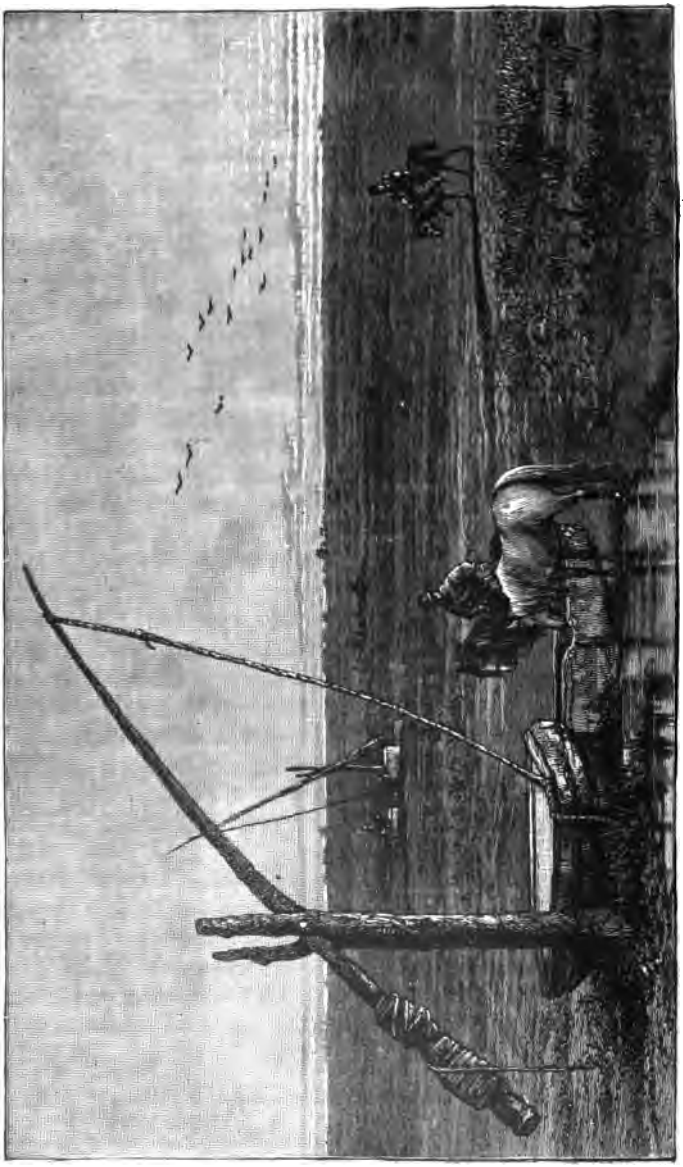


FIG. 44.—SCENE IN THE HUNGARIAN PUSZTAS. (By the kind permission of Mr. Edward Stanford)

the command of the entire trade. Intellectually the Germans are the most advanced section of the population. As this section decreases in number towards the east, so also does the general level of intellectual culture decline, and with it the state of agriculture and manufacturing industry. The most thickly populated parts of the empire are the plains on the Danube, along the spurs of the Alps, and the manufacturing strip in the north.

The diversity of the political divisions and the complexity of the government correspond to this variety of race and language; and these differences are indications of the manner in which the monarchy grew. The great political divisions having historical names and designations (Archduchies of Austria, Kingdoms of Hungary, Bohemia, &c.) are mainly the representatives of once independent states, which have been successively added entire to the possessions of one reigning family, that of the Hapsburgs, who acquired the sovereignty of the archduchies of Austria in 1282, and that of the kingdoms of Bohemia, Moravia, and Hungary in 1526.

The Government is a limited monarchy, and there are various Parliaments. First, the crown-lands or political divisions just referred to are divided into two great groups, one of which comprises the territory enclosed by the Carpathians on the north and east, bounded mainly by the Save and Danube on the south and by the Alpine provinces in the west, while the other comprises all the rest. The latter are called the Cis-Leithan, the former the Trans-Leithan crown-lands, from the Leitha, a small tributary of the Danube on the right bank on the frontier of Lower Austria. Each of these groups has a Diet or Parliament to legislate on matters common to the members of the group, and each of the crown-lands has a separate Diet for local affairs, while affairs common to the whole empire are debated in an assembly composed of delegates elected in equal numbers by the Cis-Leithan and Trans-Leithan Diets.[1]

In religion the inhabitants of Austria-Hungary are more uniform than in race, language, and government. Nearly four-fifths of the people are Roman Catholics; of the remainder, a large proportion Protestants, another large section Greek Catholics.

[1] The province of Bosnia and Herzegovina is not included in either of the groups mentioned. See Balkan Peninsula, p. 283.

Towns[1] and Districts.—1. Upper and Lower Austria and the North-western Plateaux.

VIENNA (1,365), in the east of Lower Austria, originally a stronghold to defend the eastern entrance to the narrow valley of the middle Danube, founded in the fourth century to replace the more ancient (Roman) stronghold of *Carnuntum*, farther east; restored in the twelfth century, since which period it has constantly grown in importance, not only in consequence of its being the political centre of the growing Austrian dominions, but also on account of its admirable situation for commerce. The advantages of its situation in this respect are due (1) to the fact that here the navigation of the Danube, which, above Vienna, passes through a long series of rapids and narrows, begins to be more convenient; (2) that it lies at the point where trade routes are left open between the three great highland areas of the monarchy, a westerly route along the valley of the Danube between the Alps and the north-western plateaux (a route communicating with South Germany and the Rhine), and a northerly route, communicating with East Germany, through the Moravian Gate, between these plateaux and the Carpathians; (3) that it lies on the point of the Danube nearest the head of the Adriatic, between which and Vienna the Alps are easily traversed, so that it serves as a centre in the trade between the plains of Eastern Europe and the Mediterranean.[2] At the present day Vienna is not only the capital of Austria, but the seat of one-seventh of the manufacturing industries of the empire, of a great university with a world-renowned medical school, a great art centre and money market. In Upper Austria[3] the chief town is **Linz.**

Bohemia, the lozenge-shaped province in the north-west, the drainage of which is to the North Sea, has an area about two-fifths of that of New York, with a population nearly the same in numbers and consequently more than twice as dense. Active manufacturing industry and advanced agriculture combine to give it this dense population. The sheep reared on the upland pastures, and the flax grown in similar situations, have long fostered the **spinning and weaving of wool and linen,** to which in more recent years, since the development of machine factories and the opening of coal-mines, **cotton manufactures** have been added. The extensive forests (covering in all nearly a third of the surface) have furnished material for another important industry, the making

[1] There are only fifteen towns in Austria-Hungary with more than 50,000 inhabitants.

[2] Now greatly promoted by the railway across the Semmering Pass (see p. 234).

[3] In this province lies the district known as the *Salzkammergut*, 'the estate of salt chambers,' the district from which Austria-Hungary derives a great part of its salt.

of glass,[1] for which Bohemia has long been celebrated. Though the chief mineral wealth of the Erzegebirge is on the German side, there are on the Bohemian side some mines of tin and silver in this range, the latter in Joachimsthal,[2] whence the silver thaler[3] obtained its name, and here also are the famous mineral springs of Marienbad, Franzensbad, and Karlsbad.[4]

The chief town is **PRAGUE**, a strongly built town in the centre of the province, where the Moldau begins to be navigable for larger vessels, and its valley is crossed by the road from northern Bavaria to Moravia. It is the seat of the oldest university in Central Europe (founded in 1348). No other town contains more than 50,000 inhabitants.

The population in **Moravia** and **Silesia**[5] is of about the same density as that in Bohemia, and the products are similar.

Brünn, at the confluence of the Schwarzawa[6] and Zwittawa, near a coal-field, is an important industrial centre; chief manufacture, woollens.

2. The Alpine Provinces.—Among these the population is comparatively thin, and there are few considerable towns.

The chief products of the Alpine provinces are those of the hill pastures. In the more open valleys and on the hill slopes to the east (southern Styria) there are extensive tracts of fertile land, bearing wheat, maize, fruit, and wine. In the valley of the Etsch (Adige), the largest transverse[7] valley in the Alps, there is more of an Italian than a Central European aspect. The products include silk, besides wine and fruit, and the Italian language is spreading farther north every day. In North Styria there are large quantities of iron. The **Erzberg** is almost one mass of hæmatite,[8] and in summer ore can be quarried, being worked in shafts only in winter.

GRAZ, on the Mur (trib. Drave), in Styria, now an important railway centre, is the only town with a population exceeding 30,000, and is the largest in the Alps. **Salzburg**, picturesquely built between two

[1] Wood ashes yield potash, which is largely used in this manufacture.

[2] *Thal* (pronounced *tal*) German = dale or valley.

[3] The thaler was a coin in general circulation in Germany till within the last few years.

[4] *Bad*, German = bath.

[5] Austrian Silesia is only a small remnant of the large province of that name, which once belonged to Austria, but the greater part of which was wrested out of Austrian hands by Prussia in the last century.

[6] *-awa*, a Slavonic termination signifying stream.

[7] See p. 231 n. 8.

[8] A very rich kind of iron ore.

hills, has long been of some importance as the starting-point of a route across the Alps leading into that which crosses the Brenner Pass. **Innsbruck** and **Trent** are the two towns of importance north and south of the Brenner Pass in Tyrol.

3. The Provinces bordering on the Adriatic.—Here, in Carniola, Istria, Western Croatia, and Dalmatia, limestone is the predominant rock, and as the hill slopes have been almost wholly divested of forests,[1] the surface is liable to be stripped of its soil by occasional floods and torrents of rain, and is left exposed to the piercing north and north-east winds (the **bora**). These blast the vegetation, which a blazing sun is at other times apt to scorch. Everywhere in this region rivers disappear in fissures; and caves, underground lakes, and temporary surface lakes[2] are numerous. Only here and there are fertile tracts in bowl-shaped depressions, (probably due to the fall of cavern roofs[3]), where the soil cannot be washed away. Elsewhere crops are rare, and the thin pastures are grazed mainly by goats and sheep. The population is accordingly scanty, and is mostly confined to the coast, where the barrenness of the land drives the inhabitants to the sea for their maintenance. Hence the islands and the borders of the inlets of the Dalmatian coast are peopled by fishermen, from among whom the Austrian Navy obtains its best seamen.[4]

Of the two chief seaports on this coast, **Fiume**, at the head of the Gulf of Quarnero, belongs to the Trans-Leithan provinces, the government of which is endeavouring to promote its growth at the expense of **TRIESTE**, the Cis-Leithan port, which is still by far the most important seaport of Austria. The latter town has a fine roadstead and relatively easy communication with the interior, but though it has doubled its population in the last forty years, it has latterly been somewhat checked in its growth by the revival of Venice and the growth of Fiume. It is the head-quarters of the Austrian Lloyd's, a shipbuilding company that carries on a large trade with the Levant. The town itself occupies but a narrow strip between the sea and the edge

[1] Felled in former times to supply timber for the fleets of Rome and afterwards of Venice. The most desolate part of the region described in this paragraph is known as the *Karst*.

[2] Such lakes have communications with underground cavities and form on the surface only when the latter are full to overflowing. *Zirknitz* is the largest lake which is thus from time to time formed and drained away. [3] See Introd. p. 29.

[4] Compare Brittany (p. 210) and Norway (p. 259). Like the Norwegians of the tenth and eleventh centuries, the Dalmatians (or Illyrians, as they were anciently called) were notorious for their piracy at different periods in history, the numerous creeks on the coasts of both countries affording retreats which facilitated piratical operations.

of the Istrian plateau, the top of which is now occupied by numerous suburbs. The population is almost entirely Italian in speech.

4. Galicia and Bukovina (the former acquired about 100 years ago at the division of Poland,[1] the latter from Turkey) are similar in physical features but differ in population and religion. Galicia is inhabited chiefly by Roman Catholic Poles, Bukovina by Ruthenians (another Slavonic people), adherents of the Greek Church. Both provinces are rich in agricultural produce, and in timber, salt, and petroleum.

Cracow, on the Vistula, in the west of Galicia, formerly a residence of kings of Poland, still has a Polish university, and so too has **LEMBERG**, in the east. At **Czernowitz**, the capital of Bukovina, there is a German university recently founded. Near Cracow are the celebrated salt-mines of **Wieliczka**.

5. Hungary and Transylvania, Croatia and Slavonia.[2]—Most of the towns in the Hungarian plains are more like large villages than towns. They are each spread over a wide area, with large spaces between the houses, and have few public buildings or paved streets, for which, as well as for roads, the country is scantily supplied with materials.

The capital of Hungary is the double town of **BUDA-PEST** (506), on the Danube, the Magyar town of Pest on the left bank (subject to inundations), and the German town of Buda or Ofen on the right bank. The town lies at the foot of the last hills bordering the banks of the Danube, where for the last time the river can be conveniently bridged before it spreads out over the marshy plain[3]; and this position early made it the centre of commerce for Hungary. Its growth has been greatly accelerated since the revival of Hungarian nationality in recent times; the population of Pest almost trebled itself in the thirty years 1850–1880. Next in population to Buda is **Szegedin**, the only important town on the Theiss (at the confluence of the Maros), now an important railway centre. In 1879 it was to a large extent destroyed by an inundation, which was partly ascribable to the works that had been executed to prevent such disasters in the upper part of the course of the river. **Debreczin**, farther north, is the centre of the pusstas on the Upper Theiss. **Temesvar**, the chief town of the Banat, south-east of Szegedin, is another important railway centre, and stands at the head of a shipping canal communicating with the Danube. In **Transylvania** the chief town is **Klausenburg**, in the principal valley leading down to the plains of Hungary. In **Croatia**, **Agram**, on the Save, is the principal town, and it is the seat of a Slavonic university.

[1] See p. 253 n. 1.

[2] These provinces, together with Fiume and its territory, make up the Trans-Leithan crown-lands. Hungary and Transylvania together constitute one crown-land, Croatia and Slavonia another.

[3] See Introd. p. 61 (2) (*c*).

THE EASTERN EUROPEAN PLAIN: RUSSIA AND ROUMANIA.

Approximate latitudes: (south of Shetland Islands, Christiania), St. Petersburg, 60°; (Edinburgh, Copenhagen), Moscow, 56°; Odessa, Astrakhan, 47°; (mouth of Po) mouth of Danube (western end of Caucasus Mountains) (northern boundary of New York), 45°.
Approximate longitudes: west of Poland, 18° E.; Ural Mountains, 60° E.

I. RUSSIA.—Russia, which, including Finland, has an area of upwards of two million square miles, or more than half of all Europe, occupies the whole of the east of the Continent between the Arctic Ocean and the Black Sea.[1] In the north the shallow **White Sea** communicates with the former, and in the south the still shallower **Sea of Azof** with the latter. The western coasts all line the Baltic and its branches (**Gulfs of Bothnia, Finland,** and **Riga**), and in some places are bordered by a breastwork of small islands. On the south-east there is the inland **Caspian Sea.** Almost everywhere the coasts are low and flat.

The only great mountain range is that of the **Urals,** which extend for about 1,400 miles from north to south in the east, and these, though they rise in some places to upwards of 4,000 feet in height, slope up with such gentle undulations from the European plain, that their mountainous character cannot always be recognised. Especially is this the case towards the south, where one may follow the **great trade route** which crosses these mountains at the height of 1,000 feet, in about lat. 57°, **between Perm and Ekaterinburg,**[2] without ever perceiving that a mountain range has been traversed. Hence in this part the Ural Mountains do not form a political boundary, European Russia extending 200 miles beyond them. West of the Ural Mountains Russia may be regarded as one vast plain, though the highest part of it rises to 1,100 feet above sea-level. This elevation is reached in the central plateau of the **Valdai Hills,** from which the principal rivers of Russia radiate,[3] and from which the descent is so gradual that it is impossible to fix a boundary between plain and plateau. So level is the surface,

[1] The large uninhabited Arctic islands of Novaya Zemlya or Nova Zembla ('New Land') and the Spitzbergen group are considered part of European Russia.
[2] Now connected by railway. See p. 293.
[3] See p. 183.

that the water (as in Ireland) is apt to collect in marshes, and all the rivers occasionally overflow their banks. The **Pinsk** or **Rokitno Marshes**, traversed by the Pripet, a tributary of the Dnieper, cover an area nearly as large as Louisiana, but are now in process of being drained.

In the **south-east, north and west of the Caspian Sea, is a considerable area below the sea-level**, the surface of the Caspian itself being eighty-three feet below that of the Black Sea.

From this structure of the land it results that the rivers of Russia are of much more importance than its elevations. Among these is the longest river in Europe, the **Volga**, whose basin is larger than any two countries in the continent except Russia itself, even that of one of its great tributaries, the **Kama** (left bank), being almost as large as France. All the rivers are rich in fish, among which the **sturgeon** of the Volga and its tributaries (as well as the Caspian) is especially prized.

As means of communication the rivers of Russia are of great value on three grounds. (1) Having a gentle fall, all the chief rivers and their larger tributaries are navigable almost to their source. (2) They flow from the heart of the country to all the Russian coasts. (3) They are easily connected by canals.[1] As against these advantages it must be noted that all the great rivers of Russia suffer from certain drawbacks—some from one, some from others. (1) The longest, the **Volga**, ends in an inland sea. (2) Of those which flow to the southern coast, the **Don** traverses the driest part of the country and hence is deficient in water, and the Sea of Azof, into which it falls, is itself too shallow for large vessels; the **Dnieper**, the **Dniester**, and the **Bug** all have to cross a granite plateau where the navigation is impeded by **rapids** (on the Dnieper over a course of twenty-three miles). Rapids also impede the navigation of the **Neva** above St. Petersburg. (3) The rivers of the north (**Northern Dwina** and **Petchora**), though fine full-flooded streams, traverse a part of the country less rich in products than those of the south, and terminate in a sea difficult of navigation. (4) All Russian rivers have their navigation stopped by ice for a longer or shorter period every year. Even at Astrakhan, at the mouth of the Volga, in the latitude of Bordeaux, the stoppage of navigation lasts for three months. Only the Don in some years escapes being frozen.

In addition to these difficulties besetting the inland navigation there is another hindrance to communication in Russia in the fact that the marshy character of a large part of the surface and the want of road-making material have been adverse to the making of roads, and hence the construction of railways is of peculiar importance in this country. In many parts of Russia travelling is still easiest in winter by means of sledges.

[1] See p. 184.

The **lakes** of Russia are relatively as important as the rivers. The principal lie round the Gulf of Finland.[1] **Finland** itself is a large granite plateau, the south of which is more thickly studded than any other part of Europe with lakes,[2] both large and small, all very irregular in outline. **Lake Ladoga,**[3] between Finland and Russia Proper, the largest lake in Europe, is nearly as large as Lake Ontario. Next in size are Lakes **Onega** (north-east of Lake Ladoga) and **Peipus** (south of the Gulf of Finland). In

FIG. 45.—WINTER TRAVELLING IN RUSSIA.

the depressed area north of the Caspian are hundreds of small lakes without outlets, useful as sources of supply for **salt.**[4]

As regards **climate,** Russia occupies that part of Europe where extremes of temperature are at their greatest[5] and rainfall is least. Astrakhan has a January twenty degrees colder and a July fourteen degrees warmer than that of London; and even Archangel, on the White Sea, which has a January more than ten

[1] See p. 184. [2] See p. 288. [3] 7,000 sq. miles in extent.
[4] See Introd. p. 31. [5] See p. 185.

degrees colder than Astrakhan, has a July as warm as that of the northern coasts of England. The rainfall, though scanty, occurs most abundantly in the summer months,[1] when most wanted, and hence, everywhere, except in the south-east, is sufficient for agriculture.

Vast as the country is, its **population** is but one-fourth part of the people of Europe. The average density is only about forty-five to the square mile, and there are wide areas over which it is much less. The cold of the north and the drought of the south-east cause these regions to be very sparsely peopled, the greater part of the population being thus confined to the middle region, and especially to its western portion. The variations in density correspond to variations in the nature of the products.

Five zones of production may be distinguished. (1) In the extreme north is the region of the **toundras**, where the ground thaws in summer to the depth of at most one foot, and where the only inhabitants are a few thousand Lapps and Samoyedes, who wander about with reindeer herds, as in the north of Scandinavia. This region extends to the south of the Arctic Circle only in the extreme north-east. (2) To the south of that is the **Forest Zone**, where, besides timber, resin, potashes, and other forest products, the chief commodities of trade are furs (from sable, ermine, and other fur-bearing animals). This zone is bounded by an irregular line stretching, on the whole, south-eastwards from St. Petersburg. Forests were recently estimated to cover nearly forty per cent. of the surface of Russia, but they are now being rapidly thinned. In this zone the population is still scanty. (3) The next is the **Industrial Zone**, in the heart of Russia, where agriculture is extensively pursued, but manufacturing industries are also practised to a considerable extent, so that the agricultural products of this region would suffice to support the inhabitants for only about three-quarters of the year. (4) The **Agricultural Zone**, to the south and west of the Industrial, where the agricultural produce is not only sufficient for the inhabitants, but leaves a large surplus for other parts of the country as well as for export. The southern part of the agricultural zone is known as the **Black Earth Region**, from the colour of its soil,

[1] See p. 186.

which is so fertile that, where it is found and the rainfall is sufficient, grain can be grown with less labour than in any other part of Europe.[1] This region is almost treeless, and its aspect resembles that of the Hungarian pusstas.[2] The part of the agricultural zone in the west of Russia embraces the whole of the former kingdom of Poland,[3] with part of the adjoining districts.

It is in the last two zones, and more particularly in the latter, that the population is densest; but even in these the density is one of the smallest in Europe, both manufactures and agriculture being still very far behind. Only one-third of the entire surface of Russia is under cultivation; and the region in which there is the richest soil is that in which agriculture is pursued with least care.

(5) The last zone is that of the south and south-east, that of the true Russian steppes,[4] where agriculture can be pursued only with difficulty, and the inhabitants, largely Tatars and Kalmucks, dwell in tents, and roam over the arid plains with flocks of cattle, horses, and camels, as they do in the precisely similar parts of Central Asia.

The chief agricultural products of Russia are rye, wheat, maize, and oats; but flax and hemp have greater importance here than in any other country in Europe, and their cultivation is here increasing, while in all other countries in Europe it is declining.

The mineral wealth of Russia is chiefly concentrated in the region of the Middle Urals, where excellent iron, gold,[5] platinum, copper, and precious stones are found in abundance. The coal-fields, which exist on the Donetz (a tributary on the right bank of the Don), round Moscow, and elsewhere, are able to furnish large supplies of coal, but are as yet far from being adequately worked.

Relatively to the population, the foreign commerce is not great. Among the exports, corn sometimes makes up more than one-half of the total value, and next in importance are flax and linseed and wood. The principal imports are raw cotton, tea, and iron; and the steady increase which has gone on for many years in the first-mentioned import is an indication of the growth that is taking place in the manufacturing industry of the country.

[1] The covering of black soil is not continuous, having been washed away to a large extent in the river valleys. [2] See p. 240. [3] See p. 253 n. 1.

[4] The term *steppes* is often used in a wider sense to include the whole of the treeless region of Russia.

[5] In the production of gold Russia (including Siberia) is the rival of the United States and Australia.

Though inhabited by **many distinct races** speaking distinct languages, Russia is to a large extent as uniform in its population as in its surface. Three-fourths of the people are **Russians Proper**, and of the remaining inhabitants the most numerous are the **Poles** in the west, speaking an allied Slavonic language. **Lithuanians**, speaking another language more distantly related to the Russian, form the bulk of the population south of the Gulf of Finland. There are numerous **Germans** in the provinces south of the Gulf of Finland, and many of the towns in that region were founded by Germans before the rise of the Russian power. In Finland the majority of the people are **Finns**, but the most influential section of the population consists of the **Swedes** in the south. To these differences in race correspond for the most part the differences in **religion**. All the Russians Proper are adherents of the **Greek Church**, while the Poles and inhabitants of the Baltic provinces are mainly **Roman Catholics**, and the Finlanders are chiefly **Protestants**. In Poland the difference of religion is one of the causes of the still surviving feeling of hostility between Poles and Russians; but the chief cause is to be found in the fact that Poland,[1] after having long been what Russia now is, the greatest of the Slavonic states, was, towards the end of last century, overthrown, and its territory divided by Russia, Austria, and Prussia.

In the great plain occupied by Russia extensive territories have always been under one rule; but the growth of the present empire of Russia dates only from the second half of the fifteenth century, when the Grand Prince of Moscow conquered the western dominion of Novgorod.[2] From that time the growth of the Russian Empire has been almost constant, and, though it has received a check in Europe, it is still progressing as rapidly as ever in the plains of Asia, so that the territory of the empire now covers an unbroken area almost as large as the aggregate total of the British Empire.

[1] Poland once comprised not only what is now known as Poland in Russia (the part which was formerly called the Kingdom of Poland and had till 1864 a separate government with the Emperor of Russia as king), but also many of the adjoining provinces of Russia, together with Posen and other parts of the present kingdom of Prussia, and Galicia, Bukovina, and some smaller districts now belonging to Austria.

[2] This town, situated at the outlet of Lake Ilmen, in a river valley immediately to the west of the Valdai plateau, is now of no great importance, but was in the Middle Ages one of the principal centres of commerce in Eastern Europe and a leading member of the Hansa (see p. 225 n. 2). Its decline dates from the event mentioned in the text, and was completed by the foundation of St. Petersburg.

The **Czar, or Emperor, is an absolute monarch** everywhere except in Finland, which has a constitutional government, the Emperor of Russia being there a limited ruler with the title of Grand Prince.

Towns.—1. Coast towns.—The principal seaports of Russia are on the gulfs communicating with the Baltic.

ST. PETERSBURG (1,000), on the Neva, at the head of the Gulf of Finland, the present capital of Russia, yet a town of quite modern origin. It was founded by Peter the Great in 1703 in the midst of unhealthy marshes and dreary wastes, these disadvantages being counterbalanced in the eyes of its founder by the importance of having the seat of government on the sea, so as to facilitate communication with the more civilised powers of the West. Till the latter part of 1885, when a large ship-canal through the shallow end of the Gulf of Finland to the Neva was opened, it was not even a seaport except for small vessels, although its position as capital, the canals connecting it with all the navigable rivers of Russia, and the more recently constructed Russian railways had already made it the principal seat of commerce in the empire. Before the opening of the canal, **Cronstadt**, the impregnable fortress on a small island in front of St. Petersburg, the principal naval station of Russia, was indispensable as the port of St. Petersburg for large shipping. **RIGA**, at the mouth of the Western Dwina, on the gulf named after it, the old capital of Livonia, is the second seaport in Russia, and carries on a similar trade to the east German ports of Danzig, Königsberg, and Memel,[1] but above all in flax. **Revel**, an old German town, on the south shore of the Gulf of Finland, is of less importance. Opposite on the north shore is **Helsingfors**, the present capital of Finland, seat of a university.

On the Black Sea are **ODESSA** (338), a rapidly rising seaport between the mouths of the Dniester and Bug, the chief seat of export of the wheat and other grains of South Russia; **Nikolaief**, near the mouth of the Bug, the chief naval station on the Black Sea; **Kherson**, near the mouth of the Dnieper; **Kertch**, at the mouth of the Sea of Azof. **Taganrog**, at the head of that sea, a little to the west of the mouth of the Don, is accessible only for small vessels.[2] **Sebastopol**, in the west of the Crimea, is of importance not as a seaport but as a fortress, and till 1855, when it was taken by the allied armies of the English and French, was considered impregnable.[3] The rocky coast on the south-east of the Crimea, at the base of the Yaila Mountains, has numerous small seaports, and, being protected by this mountain range from the cold winds from the north,[4] is remarkable for the contrast which its rich vegetation, quite Mediterranean in its aspect, presents to the dreary steppes occupying the greater part of the peninsula.

Astrakhan, on the delta of the Volga, is the centre of trade with the Persian coast, and **Archangel**, at the mouth of the Northern Dwina, the principal port on the White Sea.

[1] See p. 226.

[2] See p. 249.

[3] Its fortifications, destroyed after the Crimean war, have since been restored.

[4] See Introd. p. 52.

2. Inland Towns.—Small wood-built[1] villages, thinly scattered over the surface, are a characteristic feature in the Russian plain; larger towns are few in number, and many of these have, like those of Hungary, the appearance of aggregates of villages rather than towns proper.

In the Volga basin the chief town is **MOSCOW** (822), in the heart of Russia, on the Moskva, where it begins to be navigable, formerly the capital of the country, still the chief seat of its manufacturing industry, and next after St. Petersburg the principal commercial centre of the empire; also seat of the most largely attended of Russian universities. It is largely built of wood, but the gilded domes and pinnacles of its churches, and in particular those of the Kremlin, the old seat of the Czars, a walled enclosure full of churches and palaces, give it a very picturesque and striking appearance. Between **Kaluga** and **Tula**, south of Moscow, is an important coal-field with iron ores, and the latter town is an important centre of the manufacture of arms and hardware. **Nizhni-Novgorod**, at the confluence of the Oka and Volga, has not a large stationary population, but is celebrated for its annual fairs, at which two continents[2] exchange their products, when thousands of booths cover the peninsula between the two rivers, and vessels of all sizes moored along the river banks for miles together are converted for the time being into shops and magazines. **Kazan**, at the point where the Volga turns southwards,[3] is an important centre of trade.

In western Russia the chief town is **WARSAW** (490), the former capital of Poland, and still the seat of a Polish university. With its suburb of **Praga**, it commands the principal passage of the Vistula, and hence is strongly fortified. **VILNA**, on a tributary of the Niemen and the high road from Warsaw to St. Petersburg, is the chief town belonging to the old kingdom of Lithuania. **Dorpat**, west of Lake Peipus, is chiefly noteworthy as the seat of the easternmost German university, and hence the most advanced outpost of German civilisation.

In the south-west and south the chief inland towns are **KISHINEF**, the centre of the fertile government of Bessarabia; **KIEF**, on the Dnieper, and **KHARKOF**, between the Dnieper and the Don—all towns belonging to the Region of Black Earth.

II. ROUMANIA, a kingdom to the south-west of Russia, formed in 1861 out of the two principalities of Moldavia (in the north) and Wallachia (in the south-west), to which the plateau of the Dobruja on the right bank of the Danube was added in 1878. Physically it is for the most part a continuation of the Russian plain, but the northern portion is higher, and must rather be regarded as a continuation of the plateau of Galicia and Bukovina. The country is drained by numerous tributaries of the **Danube**, the principal being the **Sereth** and **Pruth**, the latter of which divides Roumania from Russia. The state is essentially agricultural, and produces enormous quantities of **maize** for

[1] The use of brick is extending. [2] Asia and Europe. [3] See p. 61 (2) (5).

export. The language is one of the corruptions of the Latin. The inhabitants are adherents of the Greek Church. The density of the population is little over 100 to the square mile.

The capital is **BUKAREST** (220), in the centre of the plain of Wallachia; and the other important towns are **Jassy**, in the centre of the plateau of Moldavia, and **Galatz**, the chief port near the mouth of the Danube, situated at the point where that river turns to the east.[1]

SCANDINAVIA.

Approximate latitudes: Hammerfest, 70½°; Throndhjem, 63½°; (south point of Shetland Islands), Christiania, Upsala (St. Petersburg), 60°; (Copenhagen), Malmö (Moscow), 56°.
Approximate longitudes: west of Norway, 5°; river Torneå, 24° E.

Norway and Sweden, the two kingdoms which compose this peninsula (the largest in Europe), are the most thinly populated countries of the Continent, the former having a population of only sixteen, the latter twenty-seven to the square mile.

This small density is explained by the position and the physical features. A large part of the peninsula lies within the Arctic Circle, and though the western shores are under peculiarly favourable influences as regards climate,[2] the benefit of these influences is felt only to a slight distance inland, owing to the nature of the surface. The greater part of the peninsula consists of a plateau of hard rocks, which sinks abruptly down on the west or Norwegian side, and more gradually in a series of terraces on the east or Swedish side. The plateau increases in elevation from north to south,[3] and its surface is everywhere too high for cultivation. It is not even covered to any great extent with pastures, but chiefly with mosses and lichens, where it does not rise above the limit of perpetual snow. The aspect is extremely dreary. It is for the most part that of a vast elevated plain,[4] broken up into tabular masses by deep but narrow gorges, and dotted here and there with mountains, which appear like large rocks scattered over the surface, and nowhere form a mountain chain. The highest mountains rise from the highest part of the plateau, where the **Galdhöppigen** rise to the height of 8,400 feet. In this region also are the most extensive glaciers, one, that of **Jostedalsbrae**, covering an area of nearly 400 square miles.

[1] See Introd. p. 61 (2) (*b*).
[2] See Introd. p. 51, and p. 186.
[3] From about 1,000 to upwards of 3,000 feet.
[4] Called by the people themselves the *fjeld* (pronounced *fyel*).

On the west side the gorges that break up the plateau reach even to the sea, and form the numerous steep-sided rocky **fiords**, which are so characteristic of the Norwegian coast. In front of the fiords is an almost continuous breastwork of rocky islands (so-called **skerries**), the principal group of which is that of the **Lofoten Islands**, within the Arctic Circle. The Swedish coast, on the other hand, is almost everywhere flat, and so also are the numerous small islands by which it is bordered.

The **lowlands** of the peninsula lie chiefly on the gentler eastern slope of the plateau, and hence occupy a much smaller area in Norway than in Sweden. In the former country they constitute only about one-hundredth part of the whole surface (on the Skager Rak), while in the latter they occupy one-third. The **chief rivers** belong to the same slope, and almost all of them expand at intervals into long lakes with cataracts at their lower end, and hence, though they can be used for floating timber, are scarcely anywhere navigable. Lakes **Wener** and **Wetter**, the largest lakes in Europe after those of North Russia, occupy rocky basins in the lowland peninsula in the south of Sweden.

About three-fourths of the people of Sweden are dependent on **agriculture** and the rearing of live-stock, and in that country the export of grain (chiefly oats) exceeds the import. In Norway the rearing of live-stock is of more importance than the tillage of the ground. In the neighbourhood of the plateau the cattle are driven up in the summer to the highland pastures, while in winter they are poorly fed under cover. Besides agriculture the chief occupations of the people are, in Sweden, **wood-cutting** and **mining**; in Norway, wood-cutting, fishing, and shipping. Almost one-half of the **timber** of European commerce is derived from the Scandinavian peninsula. The forests[1] are chiefly **pine** and **fir**, and the wood is peculiarly hard and durable.[2]

The great majority of the inhabitants belong to a **Teutonic stock**. (See DENMARK, p. 260.) The northern half of both Norway and Sweden is chiefly inhabited in the interior[3] by a separate race, known as the **Lapps** or Finns, who number at most 50,000 (probably much less). Some of these live by fishing (**Sea Lapps**);

[1] Two-fifths of the surface of Sweden is estimated to be covered with forests.

[2] Because the short summers make the annual rings of the wood very close.

[3] Almost the only settled population in the interior of northern Sweden is that round the huge ironstone mountain of Gellivara—the ore from which is conveyed to the Luleå river by means of a railway, the most northerly in the world.

while others (the **Reindeer Lapps**) travel about with herds of reindeer, which feed on the mosses that cover the plateau, and which supply them with food, drink, and clothing, and in winter drag their sledges with great swiftness across the snow.

Both Norway and Sweden now acknowledge the rule of one king, but they have separate legislatures, and in every other respect a separate government.

FIG. 46.—AN ENCAMPMENT OF LAPPS WITH REINDEER.

I. Sweden.—The more populous part of Sweden lies to the south of 62° north, and is divided into the territories of **Svealand**[1] in the north and **Gottland** in the south (the peninsula between the Kattegat and the Baltic).

In the former area are the principal mines of Sweden. In the

[1] That is, the land of the Swedes proper.

valleys of the Osterdal and Westerdal, the district known as **Dalarne**—that is, the valleys—are the principal copper mines, and nearer the coast, a little to the north of the sixtieth parallel, are the celebrated ironworks of Dannemora, where the iron is not obtained by means of underground shafts, but is quarried in the open air.[1] In this area also lies the capital of Sweden, **STOCKHOLM** (246), beautifully situated at the lower end of Lake Mälar, which is connected by a canal with an inlet on the south, and thus placed in communication with a series of canals with locks connecting Lakes Wener and Wetter with the Baltic and the Kattegat. North-north-west of Stockholm, **Upsala**, the seat of a famous university, at which Linnæus was professor.

The peninsula of Gottland is the principal agricultural region of Sweden. Here, on the Kattegat, at the mouth of the Göta-elf,[2] **GÖTEBORG** (Gothenburg), the second largest town in Sweden, and the most important of its industrial towns (cotton spinneries, &c.; best known in this country through its matches). Opposite the coast of Gottland is an island of the same name, with **Wisby** on its west coast, now an insignificant town, but with extensive walls and various ruins, to call to mind the period when it was one of the chief towns of the Hansa.[3] Near the southern end of the peninsula, **Malmö**, the chief place of transit to Denmark and Germany.

II. Norway.—The chief area for the production of timber and corn crops in Norway is a small triangle in the north of the Skager Rak.

In this triangle lies **CHRISTIANIA**, the capital of Norway, at the head of the fiord of the same name, the only town in Norway with more than 50,000 inhabitants. All the other chief towns are on the fiords of the west coast, and depend mainly on the fisheries. The principal market for fish is **Bergen**, the second largest town in Norway, on a fiord near the south; and the coasts between this inlet and the southern point of Norway (Cape Lindesnaes) are the principal scene of the herring fishery. Cod, on the other hand, are principally caught in the channel between the Lofoten Islands and the mainland, where they arrive in countless shoals about the beginning of February. Here, while the long Arctic night still continues, from 15,000 to 20,000 fishermen assemble every year with about 4,000 boats, and the fishery goes on till April. The cod are split open and dried on long lines of wooden framework (*stockfish*), or salted and dried on the cliffs behind the fishermen's huts (*klippfish*),[4] and the liver is preserved for the making of cod-liver oil. **Throndhjem** lies farther north than Bergen, on a comparatively broad fiord, affording some space for agriculture on its shores, and from it an easy road (now a railway) leads across the fjeld into the south-east of Sweden. **Tromsö** and **Hammerfest** are small towns still farther north, the latter in a latitude at which the winter night and summer day last for three and a half months. On the neighbouring cliffs eider-down is collected from the nests of the eider ducks.

[1] Comp. the Erzberg, p. 245. [2] Elf, Swedish = river. [3] See p. 225 n. 2.

[4] That is, 'cliff fish.' The cod-fish of Norway are chiefly exported to the Roman Catholic countries on the Mediterranean.

DENMARK.

Denmark, which was long associated in history with Scandinavia, is a country of very different aspect. Both mainland and islands, with the exception of the more distant rocky island of Bornholm, are essentially a part of the great European plain. The mainland is separated from Sweden by the Kattegat, which communicates with the Baltic by means of three narrow straits —the **Sound**, between Sweden and Seeland; the **Great Belt**, between Seeland and Fyen;[1] and the **Little Belt**, between Fyen and Jutland. Of these, the Great Belt is the only one deep enough to be used by war vessels; but merchant vessels come and go by way of the Sound, which is not only the shortest route, but one in which sailing vessels are favoured in either direction by the prevailing westerly winds.

The mainland portion of the country, forming the peninsula of **Jutland** (with which a detached portion on the north, now completely separated by the **Liimfiord**, was connected in the west till 1825), presents the same contrast on the east and west as the more southerly portion of the same peninsula now belonging to Prussia. The west coasts are bordered by a chain of downs or sand-hills inaccessible to shipping, while the east coast is richer in harbours. On the west a barren sandy soil extends more than half-way inland, and thus reduces considerably the density of the population, but the eastern part of the peninsula and almost all the islands are fertile.

The **inhabitants** are mainly agriculturists, and many of the peasants own the land which they till. Relatively to population, more corn is grown and more cattle are reared in Denmark than in any other country in Europe, and different kinds of grain form by far the most important export.

Till the beginning of the sixteenth century Denmark was at the head of the Scandinavian countries, having both Norway and Sweden subject to its rule; but first Sweden acquired its independence (1526), and in the present century Norway was detached. Still, however, the inhabitants of these three kingdoms are much alike in language, religion, occupations, and customs. Norwegian is only a dialect of Danish, and Swedish is a language very closely allied. The inhabitants of all three countries are Lutheran

[1] Often called *Funen* in this country, that name being a corruption of the German one. The Danish name (in the text) means 'fine,' or 'beautiful.'

Protestants in **religion**, and among the Danes, as among the Swedes and Norwegians, **education** is very generally diffused and highly advanced. There is an excellent university at Copenhagen.

Towns.—COPENHAGEN (312), the capital, chiefly on the island of Seeland, partly on the small island of Amager, arose on the best natural harbour on the Sound. Besides Copenhagen, there are only three towns with a population of more than 30,000, one of which is **Frederiksborg**, the summer residence of the royal family, a short distance from Copenhagen. The others are **Odense**, on Fyen, and **Aarhuus**, in Jutland. The other towns in Jutland are all small places, mostly at the head of the inlets, here called fiords, though unlike the steep-sided rocky fiords of Norway.

Distant Possessions.—The Faroe[1] **Islands**, north-west of Scotland, in lat. 62° N., are rocky islands, inhabited by a small number of people employed in sheep-rearing and fishing.

Iceland, still farther to the north-west, an island bisected by the 65th parallel of north latitude. It is nearly of the same size as Newfoundland, and is the largest island of Europe except Great Britain. The surface is elevated, consisting chiefly of volcanic rock covered with mosses and lichens, and the summer is too cold and damp for the cultivation of grain. The inhabitants number only about 70,000 people, who derive a scanty subsistence from the rearing of sheep and horses, and from fishing. They are the descendants of old Norwegian farmers of noble birth, and still speak the old Norwegian language, the mother language of Danish and Norwegian, and retain to the present day the love of learning inherited from their ancestors, so that education is as general among the Icelanders as among the people of Sweden, Norway, and Denmark. The island is chiefly celebrated for its active volcanoes (**Hecla**, &c.), geysers,[2] and hot springs. Chief town, **Reikjavik**, in the south-west. (On Greenland, see pp. 82, 84.)

IBERIAN PENINSULA.

Approximate latitudes: middle of Pyrenees (Balkan Mountains), 43°; (Albemarle Sound) Point Tarifa, 36° N.
Approximate longitudes: 9° W. to 3° E.

The Iberian Peninsula,[3] composed of Spain and Portugal, is the most westerly of the Mediterranean peninsulas, and that which contains the greatest proportion of land in the south. Nearly half of the peninsula lies to the south of the parallel of 40°, while

[1] In Danish Får Oër, that is, 'sheep islands.' [2] See p. 36.

[3] So called from the Iberi, who formed a large proportion of its ancient inhabitants.

only the southernmost of the minor peninsulas of Italy and the Greek portion of the Balkan Peninsula extend south of that line.

The **coast** is little varied in outline, except in the north-west, where the **rias** or fiord-like indentations, similar to the lochs of Scotland and Ireland and the gulfs of Brittany, are, like these, washed by high tides.[1]

The **surface** of the peninsula is one of the most elevated in Europe. The greater part consists of a large plateau, upwards of 2,500 feet in height, higher in the north than in the south, crossed from east to west by ranges of mountains (**sierras**). The eastern edge of this plateau is a semicircle, which descends in the north-east more or less abruptly to the valley of the Ebro, and farther south advances closer to the sea. In the south its boundary is marked by the **Sierra Morena**, which looks down on the valley of the Guadalquivir; while in the west the plateau is broken in upon by the narrow plains and terraced uplands of Portugal bordering the lower course of the Iberian rivers. In the north-east this plateau is connected with the **Pyrenees**, a lofty chain, with peaks rising about its middle (the **Maladetta** group) to upwards of 11,000 feet, and crossed by few passes as low as those of the Alps, so that the chain forms an admirable defensive frontier. The principal roads, and at present the only railways between France and Spain, are round its extremities. The long spurs from this range to the south greatly restrict the extent of the low grounds in the triangular basin of the rapid Ebro between the Pyrenees and the central plateau.

Another lofty and rugged range is less markedly connected with the central plateau in the south-east. The **Sierra Nevada**,[2] the snowy summits of which[3] are almost always visible in the clear air of Spain overlooking the sub-tropical gardens of the plain of Granada, runs north-eastwards towards the plateau without meeting it, the water-parting in this district being formed merely by high ground dotted with hills. On the south the Sierra Nevada is flanked by a long series of coast ranges of mountains, and between these and the plateau extends the only considerable tract of lowlands in the peninsula, the broad valley of the Guadalquivir.

[1] The Mediterranean coasts are almost without tides (see p. 45).

[2] Spanish = Snowy Sierra.

[3] The highest peak, *Mulahacen*, is even higher than the loftiest summit of the Pyrenees.

On the plateau the water-parting between east and west runs generally near the eastern edge, so that most of the chief **rivers** have a long course westwards towards the Atlantic, while their basins are limited in breadth by the mountain ranges that cross the plateau. These rivers are—the **Douro**, between the Cantabrian Mountains (a continuation of the Pyrenees along the north coast) and the series of sierras which wind from Lisbon to the south-west frontier of Aragon,[1] forming in its eastern section the boundary between the old provinces of Leon and Estremadura, Old and New Castile; the **Tagus**, between this series of sierras and that of which the Sierra Toledo is the principal section; and the **Guadiana**,[2] between the latter and the Sierra Morena. None of the table-land rivers is of great importance for navigation, chiefly because they all have rapids caused by rocky shallows in their lower course where they have to pierce their way through mountain barriers. Hence they do not serve as a means of union for Spain and Portugal. In this respect they agree with the **Ebro**, but contrast with the **Guadalquivir**, which, having throughout a gentle flow, has been made navigable by dredging for large vessels to Seville, and can be ascended by boats far into the interior.

The rocks of which the surface of Spain is composed are, like those of Britain, very varied in geological date; and to this circumstance it probably owes its **extraordinary wealth in minerals**, exceeding that of most, if not of all other countries of Europe, though this wealth is far from being fully utilised.

The minerals are most abundant on and near the north and south boundaries of the plateau. In the north the Basque Provinces (in the south-east angle of the Bay of Biscay) are remarkably rich in iron, and coal is now known to exist in many districts, the largest field being in the Asturias. In the south are found the enormous deposits of copper at Rio Tinto, for which Huelva, in the south-west, is the place of export; farther east the lead ores of Linares, and within the plateau the quicksilver mines of Almaden. Sulphur and salt are also abundant.

The **climate**[3] is on the whole the driest in Europe. The edges of the plateau condense the moisture from the surrounding seas before it reaches the interior, which is hence to a large

[1] The chief member of this series of sierras is the *Sierra de Guadarrama*.

[2] The first part of the names Guadiana and Guadalquivir (as well as of other rivers in Spain) is derived from the Arabic *wadi*, a river: see below, p. 264.

[3] Regarding the climate and vegetation of the Mediterranean countries generally see Europe, pp. 184-5.

extent an arid steppe without trees, and fitted at most for sheep pastures. Only the north and north-west are abundantly supplied with rain, and hence have forests and agricultural products similar to those of Central Europe. On the other hand, the upland terraces and lowlands surrounding the plateau on the west, south, and east, are rich in evergreens (the **olive** and the **cork-oak**), in **wine**, and **southern fruits**, the cultivation of which, especially in the south, is almost wholly dependent on irrigation. The oases thus dotted here and there over vast barren expanses give to many parts of the peninsula an African aspect, on which account it is frequently described as **Africa in Europe**. The most unhealthy part of the peninsula is the marshy district on both banks of the Lower Guadalquivir. In almost all parts the principal grain is **wheat**.

For six centuries the Iberian Peninsula was subject to the dominion of Rome, and was then **thoroughly Romanised**, so that notwithstanding all the subsequent changes the **language** has remained essentially a daughter of the Latin. At the break-up of the Roman Empire (fifth century A.D.) Spain was overrun by the Teutonic tribes of the **Western Goths** (Visigoths), who settled among, but did not displace, the old Romanised inhabitants. A different sort of invasion took place early in the eighth century, when the Mohammedan **Arabs** or **Moors**[1] crossing over from Africa soon made themselves masters of most of the peninsula. Though gradually driven backwards they retained the southern provinces till the close of the fifteenth century. For a great part of this period these Moorish provinces were the home of the highest civilisation in Europe, and many beautiful buildings, adorned with the peculiar kind of ornamentation known as arabesques,[2] have survived as witnesses of this extinct civilisation; and the fine irrigation works of the south are a still more important relic of Moorish dominion. The gradual wresting of the soil of Spain out of Moorish hands took place from different centres, whence arose several independent states,[3] which were only in course of

[1] Really Arabs, but generally known as Moors because they came over from Morocco.

[2] The Mohammedan religion forbids the imitation of living things, whether animals or plants, and hence arose a style of ornamentation called arabesque after the Arabs, in which gracefully curved lines are the prevailing feature.

[3] The names of which still survive in those of the old provinces of Spain, but these old provinces have now given place to others of smaller and more equal size.

centuries merged in one. The final expulsion took place just after all the provinces of the present Spain except those in Moorish hands had been brought under one rule. Portugal, separated from Spain by a belt of inhospitable thinly populated country, has remained independent except for a period of sixty years (1580 to 1640). Both countries were at the height of their power at the time of the discovery of America, and their maritime situation encouraged them to undertake marine enterprises, which resulted in their making settlements and establishing their dominion in large areas of the newly discovered lands across the Atlantic, as well as in the East Indies and on the route thither round Africa. Of these only a small proportion remain connected with the mother countries.[1] In both countries the **government** is now a limited monarchy.

I. **PORTUGAL**, a country of nearly the same size as the State of Maine, well adapted by its situation for maritime activity, but which shows scarcely a vestige of the enterprise which it once displayed by sea. Almost all the trade is in the hands of England, whence are derived most of the manufactured goods used in the country, which exchanges for them chiefly **wine** and **cork** (the bark of the cork-oak). About half of the surface is unproductive (yielding not even timber), the productive portion being confined to the vicinity of the coast and the banks of the rivers; the only mineral product is salt. There are only two important towns in the country, both seaports.

PORTO or **OPORTO**, at the mouth of the Douro, is the place of export of the wine to which it gives name (*port*), which is grown on the banks of the river. **LISBON** (308), at the mouth of the Tagus, the capital of the country, though like Oporto an ancient town, has quite a modern appearance, having been mostly rebuilt after its destruction by the tremendous earthquake of 1755. The small town of **Coimbra**, on the Mondego river, between the Douro and the Tagus, is the seat of a university.

II. **SPAIN**, a country about one-fifth larger than California, with a population fourteen times as numerous as that of that State, is yet thinly peopled for a European country. Only round the coast does the population exceed 100 to the square mile, and more than half the plateau (in the east and south) has a density of less than thirty to the square mile.

1. **Catalonia**,[2] in the north-east, has a soil not naturally fertile, but the inhabitants, the most energetic in Spain, have cultivated it with great care, and have developed cotton and other manufacturing industries on a great scale.

[1] See p. 285. [2] The names following the numbers are those of the old provinces.

On the coast **BARCELONA** (272), a town which has grown up round a rock that rises boldly above the richest plain on this part of the coast. It is the principal seaport as well as the principal seat of manufactures in Spain, and the second town in population.

In the north of this province, among the Pyrenees, is the small independent republic of **Andorra**, less than 200 square miles in extent.

2. Valencia and Murcia, the next maritime provinces to the south, are characterised by numerous short rivers, on the banks of which are still to be seen some of the finest examples of the old Moorish irrigation works; in the so-called **huertas**,[1] in which every field is surrounded by small canals.

The province of Valencia is the chief silkworm-rearing province in Spain; and the city of **VALENCIA**, occupying a delightful situation on the delta of the Guadalaviar is the chief seat of the Spanish silk industry. It is an old Roman town, and a little to the north the site of another ancient seat of commerce, *Saguntum*, is marked by the village of Murviedro.[2] In the south of the province, **Elche**, a celebrated oasis of date-palms; on the neighbouring coast the fine seaport of **Alicante**, from which are sent out the products of the rich plain of Murcia, as well as the esparto grass which covers a large part of the maritime strip. **Cartagena**, on the coast of the latter province, owes its foundation[3] to a fine bay which admirably adapts it to serve as a naval station. It is strong in its situation, and strongly fortified, and is now also a thriving commercial seaport.

3. Andalusia is made up of the lowlands forming the valley of the Guadalquivir and the highlands in the south, which once formed the kingdom of Granada.

On the steep, rocky coast of the latter ancient kingdom are two seaports of some consequence, on account of their trade in southern fruits, &c.—**Almeria** and **MALAGA**, the latter on a small strip of flat land where the mountains retire a little from the coast. Near the south point of Spain, on the Bay of Algeciras, **Gibraltar**, an almost impregnable fortress, commanding the entrance to the Mediterranean, held by the British since 1704. But it is on the plain of Andalusia that the chief cities of the province lie. It is on this sunny plain, where sugar-cane, cotton, and the cactus known as the prickly pear are among the objects of cultivation, and the agave, castor-oil plant, and olive even run wild, that we meet with the Spanish cities which still retain something of the splendour which they had during the time of the Moorish occupancy. **SEVILLE**, on the Guadalquivir, an active seaport as well as a rising seat of industry; **Cordoba**,[4] higher up on the same river, once a seat of Moorish dominion, but now greatly declined, partly in consequence of the fact that the Guadalquivir is no longer navigable so high up for vessels of large size; **Granada**, on a small plain near the head-

[1] Spanish = 'gardens.' [2] A corruption of Lat. *muri veteres* = 'old walls.'

[3] By the Carthaginians. It is the *Carthago Nova* of the Romans.

[4] Often spelt Cordova, the Spanish *b* between two vowels being pronounced very like a *v*.

waters of **Jenil**[1] (trib. Guadalquivir), the last seat of Moorish dominion (taken by the Spaniards in 1492), and celebrated for its **Alhambra**, the old palace of the Moorish kings. The irrigated plain which surrounds it, here called by the Arabic name of the *Vega*, rivals in fertility and beauty the huertas of Valencia and Murcia. On a small island off the coast stands the fortified seaport of **Cadiz**, founded by Phœnicians about 1100 B.C., the place of export of the wine which takes its name of sherry from the neighbouring town of **Jerez**.[1] To the north-west of Cadiz lies **Palos**, situated on a little inlet at a distance of some four miles from the coast, and noteworthy as the starting-point from which Columbus, Magellan, and other navigators set out on their western voyages.

4. **The Northern Provinces of Spain.**—Galicia, the Asturias, and Biscay, with a strip of Old Castile; a region covered with forest-clad mountains, noteworthy in the history of Spain as having always been the last refuge from invaders.

The most easterly province, Biscay, takes its name from the **Basques**, who are the last remnant of a population whose language has no recognisable affinities with any other known speech. All the places of importance are on the coast. **Ferrol**, on one of the rias of the north-west, is the principal Spanish naval station. **Santander** and **Bilbao**, on the north coast, two busy seaports, the latter exporting a great deal of iron ore from the neighbouring mines.

5. **The Provinces of the Castiles**, Old and New, the name of which is a memorial of the numerous castles or strongholds erected by the Christians to secure their successive conquests from the Moors, embrace the most desolate portions of the Spanish table-land, these occupying the east (round the head waters of the Tagus and Jucar)[1] and south (La Mancha). The somewhat more favourable tracts to the west produce a number of aromatic herbs which afford a suitable pasture for the migrating sheep (merinos),[2] which are kept in summer on the table-lands of New Castile and Leon, while in winter they are driven down to the more sheltered valleys of Estremadura and Andalusia.

MADRID (472), the highest capital in Europe (2,200 feet), and the dreariest in situation, owes its elevation to the rank of capital (by Charles V. in the first half of the sixteenth century) solely to its central position; and **Valladolid**, in Old Castile, an earlier capital of Spain, owes its importance to a similar cause, being the centre of one of the minor table-lands of the peninsula. **Toledo**, forty miles south of Madrid, occupies a strong situation on a rock overhanging the Tagus, and was one of the older capitals, but is now decayed; it has long been celebrated, as it still is, for its swords.

[1] Formerly spelt Xenil, Xerez, &c., *j* being now used in Spanish for the sound once represented by *x*. This sound is that of a strongly aspirated *h*.

[2] The stock from which this breed of sheep is derived is said to have been introduced from North Africa in the fourteenth century.

6. **Aragon**, on the north-east of the Spanish tableland, is a thinly-populated province, in which the inhabitants display little of the energy shown by their neighbours of Catalonia in overcoming the defects of the soil.

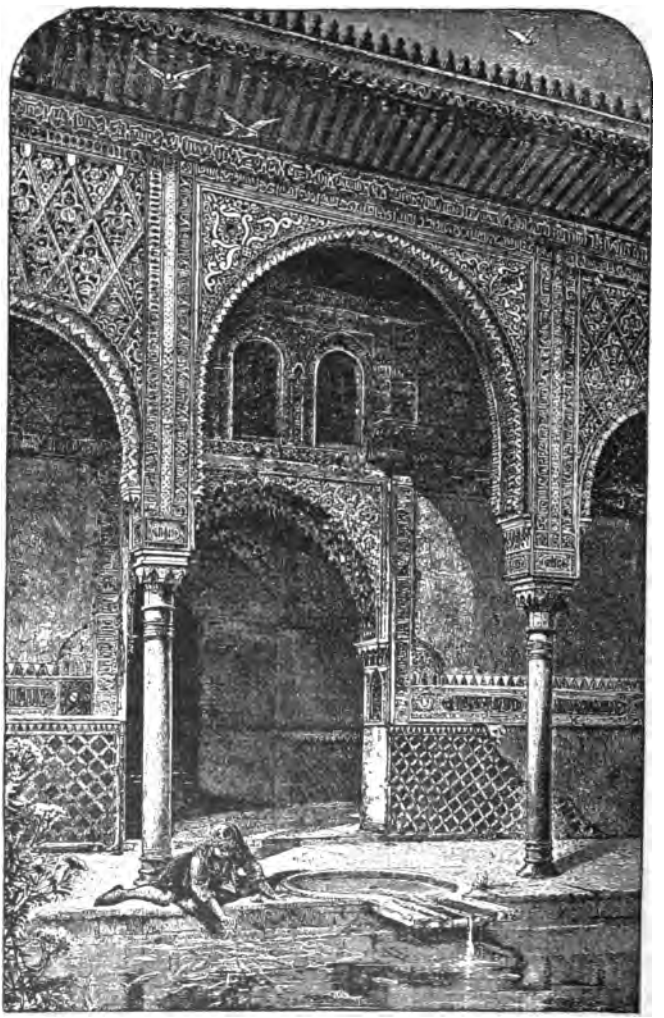


FIG. 47.—THE ALHAMBRA. (By the kind permission of Messrs. Hachette.)

Its only large town, **Zaragoza**, on the Ebro, has always been of great military importance, since it stands at the point whence the easiest route leads up to the central plateau (by the valley of the Jalon,[1] a route now followed by a railway).

7. The Balearic Islands, to the east of the Gulf of Valencia, are all more or less mountainous.

The principal town, **Mahon** (for part of last century in the possession of the British), stands in Minorca, the least mountainous of the three larger islands.

ITALY.

Approximate latitudes: (St. Etienne) Milan, Venice, 45½° N.; (Chicago) (north of Portugal) Rome 42°; (San Francisco) Palermo (Athens), 38°.
Approximate longitudes: 7°–18½° E.

The mainland of Italy, a country nearly equal in area to Georgia and Florida, is composed of a long peninsula almost filled by the Apennine Mountains, and a plain on the north, bounded by the Alps, and drained chiefly by the Po. Besides smaller islands, the kingdom includes also the two large mountainous islands of Sicily and Sardinia.

Almost everywhere the **Alps** descend rather abruptly to the north plain. Immediately at their base, and enjoying in an eminent degree the shelter afforded by them from cold north winds,[2] lie four beautiful lakes (**Maggiore, Como, Iseo, Garda**), amidst vegetation which will not flourish in the plain farther south. On the opposite side of the plain the **Apennines** descend inwards more gradually in a series of terraces, and the straight road connecting the towns of Rimini, Bologna, Modena, Parma, and Piacenza, the road anciently called the **Via Æmilia**, and now giving name to the Emilian provinces, marks very well the limit between highlands and lowlands. At Rimini this road, now accompanied by a railway, touches the coast, which it henceforth follows as far as the peninsula of **Gargano**, thus showing how close the Apennines advance to the sea in this part of Italy. It is on this side, a little to the north-west of the peninsula just named, that these mountains reach their highest elevation (a little under 10,000 feet) in the rugged province of the **Abruzzi**.

The **principal plains** of the peninsula are—(1) that of the Arno, in the north of Tuscany; (2) that of Campania,[3] round Naples; and (3) the larger but less fertile lowlands of Apulia, in the

[1] See p. 267 n. 1.
[2] See Introd. p. 52.
[3] Not to be confounded with the Campagna round Rome.

south-east. All of them are small by comparison with the great plain of northern or so-called Upper Italy. Unhealthy marshes occupy many parts of the coast, especially in the west and south.

The only lake belonging to the Italian Plains is the **Val di Comacchio**, at the mouth of the Po, south of the delta, a shallow lagoon cut off from the Adriatic by a low and narrow spit of land. It is valuable for its eel-fisheries and salt-pans. Of the **lakes of the Apennines** (**Trasimeno, Bolsena, Bracciano**), the two latter occupy the craters of extinct volcanoes.

Though mountains and highlands occupy so large a part of the area and have been to a large extent stripped of the forests that once covered them, the **productive surface** of the country is relatively large, hill pastures being very extensive. Only about two-fifths of the surface, however, is suitable for agriculture, and Italy is among those countries which have to import grain; while its dearth of coal and iron prevents it from taking a high place in manufacturing industry, and necessitates a large import of manufactured goods. The products on which it chiefly depends for **export** are **wine, oil** (from the olive), and above all **raw silk.**

Among **minerals, iron,** though not abundant, is found of excellent quality at various places (island of Elba, &c.) A fine kind of **marble** is quarried at Carrara, among the Apuan Hills, in North Italy; but the **sulphur** of Sicily and southern Italy makes up at least half the value of the mineral produce of the kingdom.

Though apparently formed by nature to constitute a single state, few countries have had a greater variety of settlers and dominions within their boundaries than Italy. In ancient times, numerous flourishing **Greek Colonies** studded the shores of the southern half of the mainland, and both **Greeks** and **Carthaginians** formed settlements in Sicily, while **Kelts,** breaking in through the passes across the Western Alps,[1] occupied the northern plains. Ultimately, however, the whole country was subdued by the strong hand of Rome, and was kept under one rule for more than 500 years. But on the downfall of Rome, in the fifth century A.D., Italy became a prey to numerous foreign invaders, and once more broke up into a number of different states. A German tribe, the **Lombards**[2] (**Longobardi**), settled in the northern plains, and others advanced farther south. At a later date **Arabs** (Saracens) and **Normans** settled in Sicily and southern

[1] See p. 233.

[2] Whence the name Lombardy.

Italy, and Germany, France, and Spain, all in turn invaded Italy and seized on parts of it, which they retained for a longer or shorter time. Throughout the greater part of the Middle Ages, and for centuries after, the country was broken up into a large number of independent cities and small states, yet this is one of the most brilliant periods of Italian history. The favourable situation of Italy in the middle of the Mediterranean gave this country the command of the trade between the east and west, and the wealthy trading republics of Genoa and Venice, for example, had settlements even on the Black Sea. Their trade and their glory declined, however, when by the discovery of the New World Italy came to be no longer in the centre of the highways of commerce.[1] The political unity of Italy was completely effected only in 1870, when the last remnants of the States of the Church were annexed to a kingdom, the original nucleus of which was the kingdom of Sardinia, made up of the island of that name together with the north-western portion of the mainland. The **government** is a limited monarchy.

The **population**, upwards of 260 to the square mile, is one of the densest in Europe, and there is a considerable annual emigration, principally to the republics of South America. The Italian **language** is the least modified of all the descendants of the Latin. The **religion** is Roman Catholic. Elementary **education** is rapidly extending, but great numbers of the inhabitants, especially in the south, are still unable to read and write.

Italy is divided into provinces, the average size of which is about the same as that of a French department, but some of the names of the older divisions (Venetia, Lombardy, &c.), still survive as those of groups of provinces called territorial compartments.

Towns and Districts.—1. The Northern Plains.—Besides the Po and its tributaries, these plains are drained by numerous other rivers, the chief of which (Adige, Brenta, &c.), enter the Adriatic to the north of the Po. Numerous irrigation and some navigable canals are led from these streams, and the region is thus one of the best watered and most productive in Europe. The abundant sediment brought down from the Alps by the rivers is constantly extending the land seawards, particularly in the region of the Po delta, where Adria, in ancient times a coast town from which the Adriatic obtained its name, is now more

[1] Comp. British Isles, pp. 193-4.

than twenty miles inland. Though sharing in the benefit of a warm climate enjoyed everywhere in the Mediterranean region,[1] this part of Italy has summers too moist and winters too cold for the cultivation of the olive and the members of the orange tribe. The summers are warm enough, however, for the growth of **maize** and **wine**, and for the rearing of **silkworms**; the vines being often hung in festoons between mulberry trees, on the leaves of which the silkworms feed. The silk thus produced furnishes the material for the making of **silks** and **velvets**—the chief manufacturing industry, not only of these provinces, but of the whole kingdom. The pastures are rich, and are the mainstay of another leading industry of the region, the making of cheese. The district round Lodi, where the so-called Parmesan[2] cheese, is made, is famous for its six crops of grass in the year. Rice is grown on the marshy depressions on the banks of the Po. Large towns are numerous.

On the Po, before it enters on the plains, stands **TURIN** (336), capital of the former kingdom of Sardinia, afterwards the first capital of the kingdom of Italy; situated at the point towards which three passes across the Alps converge, and now on the railway which pierces the Alps at the Mont Cenis tunnel. Lower down on the Po, **Piacenza**, at the point where the banks of the river begin to be marshy, and hence at the lowest point at which the river could be conveniently bridged, so that it became not only the terminus of the Æmilian road, but also the meeting-place of the roads from Italy and Switzerland. Still lower down on the Po is **Cremona**, once noted for its violins. **MILAN** (432), in the centre of the rich plain between the Ticino and the Adda, occupies a similar situation to Turin, at the focus of the chief passes leading from the north across the Alps, now on the railway which pierces these mountains by the St. Gothard tunnel, and hence an important centre of trade between Italy and Central Europe. In the Middle Ages the seat of a grand-duke, it is now of importance chiefly as the town in which manufacturing industry is most highly developed in Italy. Its marble cathedral is also celebrated.

On the east and west of Lombardy, lines of defence are created by broad rivers with marshy banks. On the west the line is that of the Ticino, near the mouth of which is the town of **Pavia**, which has in consequence been a frequent scene of battle. On the east the lines referred to are those of the Adige and the Mincio, and on these rivers stand the fortresses of the famous **Quadrilateral** (Mantua, Verona,[3] Peschiera, and Legnago).

On the coast stands **VENICE**, built on a hundred islands[4] behind a line of low sandbanks (*lidi*), due to the joint action of rivers and sea-

[1] See Europe, p. 184. [2] Not made at Parma, as the name would imply.

[3] Verona defends the mouth of the valley leading down from the Brenner Pass (see p. 234 (3, *a*).

[4] Now connected with the mainland by a railway bridge more than a mile in length.

currents, but now strengthened by walls, while the openings between them (narrow enough to be stopped by the sinking of a single vessel) are protected by forts. In this easily defended situation Venice was founded in the fifth century A.D. by refugees from neighbouring Roman towns sacked by the Huns, and through its admirable position for commerce (the valley of the Adige and the Brenner Pass serving as a communication between it and Central Europe), it soon became a thriving city, and ultimately for a time the centre of commerce in Italy. Art and luxury followed the attainment of wealth and power, and the beautiful buildings whose foundations rest on piles and are washed by the arms of the sea which in this remarkable town take the place of streets, are the admiration of all the cultivated peoples of the west. It is still a busy seaport, and has regained a little of its former prosperity since the opening of the Suez Canal. On the Brenta, **Padua**, the seat of a university long famous.

Of the towns on the Æmilian road already mentioned, **Parma** and **Modena** are noted in history as the seats of independent dukes, whose territories were annexed to the kingdom of Italy only in 1860; **Bologna** is the seat of one of the oldest of European universities, once specially famous as a school of Roman law; **Ravenna**, though now an unimportant inland town, was the Venice of ancient times, a city built on islands, and hence on account of its strength made by Augustus a naval station, and during the time when the northern barbarians were overrunning Italy chosen as the seat of government by some of the later Roman emperors, and afterwards by the exarchs or governors of the Italian territory which remained under the rule of the emperors of the East.

2. Middle Italy and the Riviera.—The Riviera is the name given to that sheltered strip of coast, partly in France and partly in Italy (**San Remo**), where invalids from all parts of Europe come to enjoy the benefit of a mild climate amidst charming scenery and a sub-tropical vegetation. From the ancient inhabitants this strip of coast has the name of **Liguria**.

GENOA, the former rival of Venice, and now the chief seaport of Italy, built tier above tier in face of a fine bay, which lies at the mouth of the **Bochetta Pass**[1] across the Apennines, once the most important trade-route in this part of Italy, but now superseded by a railway. In recent times Genoa has prospered even more than Venice, from the fact that all the railways of the north converge here (the line piercing the Apennines in a tunnel situated a little to the east of the pass just mentioned).

In **Tuscany** are several cities formerly celebrated, if not still of great importance. Chief of these is **FLORENCE**,[2] on the Arno, in the midst of the Tuscan lowlands, which are broken up by ranges of hills

[1] See Introd. p. 61 (8) (δ).

[2] The winter temperature of Florence is 5° Fahr higher than that of Bologna, only fifty miles distant but on the north side of the Apennines. (See p. 52.) Before the introduction of railways the pass of Pietra Mala or La Futa (3,000 ft.), on the road from Florence to Bologna, was one of the most frequented in the Apennines, but the railway between the two towns (less direct in its route) now ascends the valley of the Reno and crosses the Apennines farther to the west.

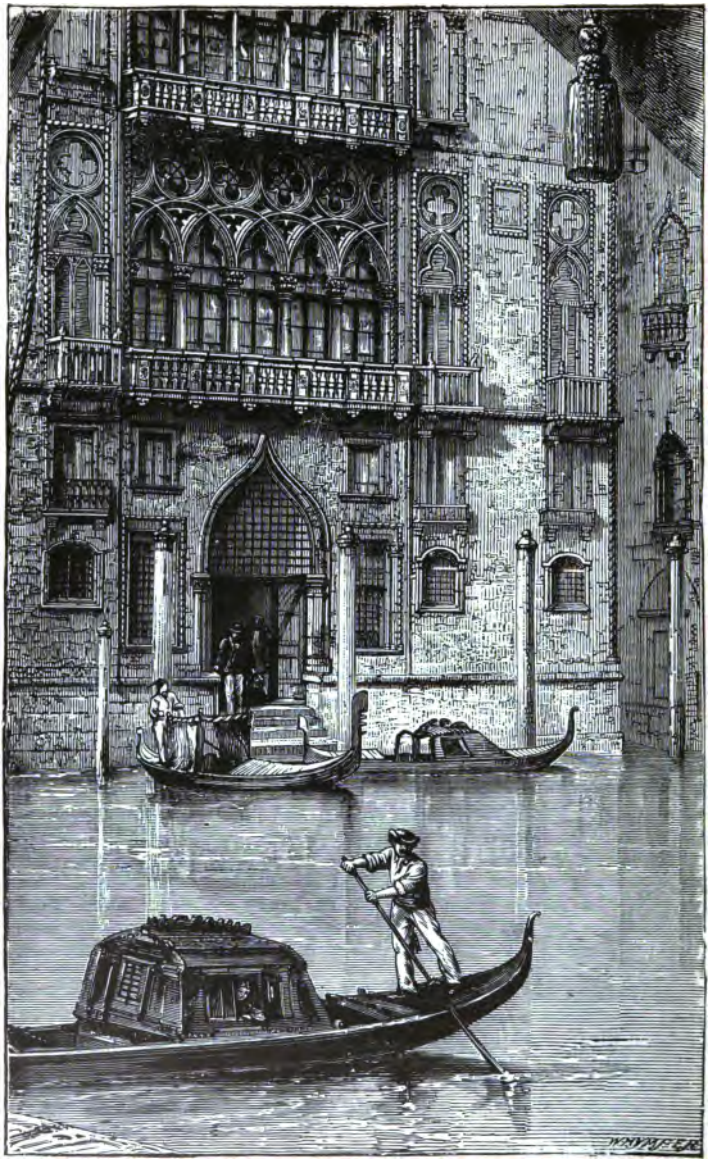


FIG. 48.—FRONT OF A VENETIAN PALACE, WITH GONDOLAS, OR VENETIAN BOATS, IN THE FOREGROUND.

into a number of small plains, each as carefully watered and as fertile as the plains of Lombardy, but enjoying under the shelter of the Apennines a much warmer climate, so that the olive gardens are the most celebrated in all Italy. A city of comparatively recent growth, it was during the fifteenth and sixteenth centuries one of the most powerful in Italy, and, being then a favourite home of artists, is famous for its art treasures. Straw-plaiting and silk manufactures are the principal industries at the present day. **Pisa**, near the mouth of the Arno, before the rise of Genoa and Florence a great seaport and powerful republic, is noteworthy on account of its university and of the old buildings, splendid relics of the Middle Ages, enclosed within its walls. It is now inaccessible to sea-going vessels in consequence of the silting up of the mouth of the river. To take its place as a seaport the Florentines constructed on the coast farther south the harbour of **Leghorn**.[1] Between Leghorn and Genoa is the fine natural harbour of **Spezia**, the chief naval station of Italy. Among the thinly populated and poorly watered provinces of South Tuscany, **Siena**, though no longer a populous town, is worthy of mention as having also been in former times the seat of a powerful republic.

In **Latium, Umbria, and the Marches**, which are nearly covered by the Apennines and its branches, there is only one town with more than 50,000 inhabitants. That town is **ROME** (451), on the Tiber, since 1870 the capital of the kingdom of Italy, in succession to Florence; in ancient times the capital of the Roman Empire, of which the ruins of the Forum, the Pantheon, and the Colosseum are symbols; afterwards the seat of the popes and as such the head of Western Christendom, which is still more conspicuously symbolised by the magnificent dome of St. Peter's on the right bank of the Tiber. Founded (it is said in the eighth century B.C.) on the last hills bordering the Tiber, at a point to which the river could be ascended by small ships,[2] it soon became the meeting-place of the chief roads across the Apennines, and hence grew in size and power. It is now the chief resort of artists, and is visited on account of its historical associations by people from all parts of the civilised world. The country round, the **Campagna**, in ancient times carefully cultivated, has fallen out of cultivation and is now a barren plain rendered almost uninhabitable by malaria. Still more pestiferous are the **Pontine Marshes**, in the extreme south of Latium, uninhabitable even in ancient times. On the east coast is the seaport of **Ancona**.

8. **Lower Italy**, comprising the wild region of the **Abruzzi**, the sheep pastures of **Apulia** in the south-east, the mountainous **Calabria** with its malarial coasts in the south-west, and in the west the fertile plain of Campania.

On the coast, on a beautiful bay fronting the small islands of Ischia and Procida, stands **NAPLES** (523), the most populous city in Italy with a considerable silk industry, till 1860 the capital of a kingdom which embraced the whole of Lower Italy and Sicily. Overlooking the same bay is **Mount Vesuvius**, the only active volcano on the mainland of Europe. Its first recorded eruption (A.D. 79) overwhelmed with its ashes the cities of **Herculaneum** and **Pompeii**, the disinterring of which in the present day has brought to light many Roman remains of the

[1] Ital. *Livorno*. [2] See Introd. p. 61 (1) (*b*), (3) and (4).

greatest interest. **Capua**, on the Volturno, in ancient times the chief town in Campania, has sunk into complete decay, chiefly in consequence of the swamps now existing on the banks of the river. On the coast of Apulia is **Brindisi**, in ancient times, under the name of *Brundusium*, the place of transit to Greece, and now again an important seaport as the terminus of the land-route (through the Alpine railways) to Alexandria and the East.

4. **Sicily and Sardinia.**—Though nearly equal in size, these islands present a great contrast in natural fertility and hence in populousness.

FIG. 49.—A STREET IN POMPEII: VESUVIUS IN THE DISTANCE.

The former has considerable mountains, only in the north; most of its surface is covered with **wheatfields** and groves bearing **southern fruits**. Three towns in it have at least 100,000 inhabitants—**MESSINA**, on the straits of the same name (under which it is now proposed to pierce a tunnel); **CATANIA**, on a charming plain at the foot of Mount Etna, on the east coast, and the beautiful **PALERMO** (276), on the north coast. **Mount Etna** is an active volcano, rising with an exceedingly regular and gentle slope to about 11,000 feet in height. The anciently celebrated city of **Syracuse**, near the southern end of the east coast, is now only a gloomy and dirty town of no importance. The island altogether, though less than one-third of the size of Ireland, has a population more than half as great.

Sardinia has only one plain of importance, stretching from north-west to south-east, between the **Bay of Oristano** and that of **Cagliari**, which latter takes its name from the chief town in the island. **Oranges** are an important product, and in the south-west are rich mines of silver-yielding lead and of zinc.

Midway between Sicily and the coast of Africa lie the rocky limestone islands of **Malta**, **Gozo**, and **Comino**, inhabited by a dense population speaking a corrupt mixture of Arabic and other languages. They have been held by the British since 1800.

On Malta is the strong fortress of **La Valletta**, which carries on a large trade with North Africa, and is an important coaling station.

THE BALKAN PENINSULA.

Approximate latitudes: (New York) (Naples) Constantinople, 41°; (Mouth of Potomac River) Athens, 38°.
Approximate longitudes: west of Bosnia to the Bosporus, 16°–29° E.

This name is applied to the easternmost of the three Mediterranean peninsulas, lying between the Adriatic and Ionian Seas on the west and the Black Sea and the Ægean on the east; on the north we may assume as the boundary the lower Save and Danube, as far as the south point of the Dobruja, thus excluding Roumania.

The whole peninsula, along with the adjacent islands, may be described in general as **a land of mountains**, partly depressed below sea level, so that the higher parts on the margin are in some cases cut off as islands separated by valleys and passes now submerged, and in other cases run out to sea as peninsulas between which the lower parts of former land valleys now form deep gulfs. A rise of the sea-bed to the extent of about 100 fathoms would bring almost all the smaller islands into connection with the mainland.

So closely are the mountains crowded together that communication between different plains and valleys is always somewhat difficult, and hence the main routes marked out by nature for intercourse have in this part of Europe a special degree of importance. Two great roads following such natural lines proceed from different points in the south to the heart of the peninsula, neither route rising at any part more than 2,500 feet above sea-level. One of these starts at Constantinople, in the south-east, and, traversing one of the largest plains of the peninsula, ascends the valley of the **Maritza**,[1] passes the important towns of Adrianople and Sofia, and after crossing the water-parting descends into the basin of the **Morava**, and from the town of Nish follows that valley till it approaches the Danube; the other, starting at Salo-

[1] The largest river in the peninsula except those on the northern frontier.

nica, in the north-west of the Ægean Sea, ascends the valley of the **Vardar** as far as lat. 42° N. (Üsküb), and after crossing a water-parting only about 1,700 feet in height descends into the valley of the **Bulgarian Morava**, by which it proceeds to Nish. There it joins the road from the south-east. The depressions followed by these roads, depressions along which railways have recently been constructed, mark off **the mountains of the peninsula** into **three groups**—a western, a north-eastern, and a south-eastern.

In the western group the mountains, where they form chains at all, trend for the most part more or less north and south. The principal range is that of the **Dinaric Alps**, a limestone chain having the same character and aspect as the Karst region,[1] backed by plateaux of a similar nature, extending from north-west to south-east along the frontier of Bosnia. Towards the south they merge in the irregular mountain groups of Montenegro,[2] where some of the summits rise to the height of 8,000 feet. Farther south the **Lake of Skodra** or **Scutari**[3] and the valley of the **Drin** form a depression between the mountains of Montenegro and the short range of the **Shar Dagh**, which, running north-east and south-west, attains as great an elevation as the former; and between this range and the lower range of the **Kara Dagh**, to the north-east, the road and railway from Salonica are continued northwards from Üsküb.

To the south of the Shar Dagh the general trend of the mountains becomes more or less north-west and south-east. Such is the direction of the **Pindus** chain, the principal chain in Greece, forming the western boundary of the plain of Thessaly or valley of the **Salamvria**.[4] Farther south the mountains, many of them 6,000 to 8,000 feet in height, become still more thickly crowded together. North of the Gulf of Corinth the celebrated **Mount Parnassus**, visible from almost all parts of Greece, rises to a height of more than 8,000 feet. The peninsula of the **Morea** or Peloponnesus, south of the Gulf of Corinth, consists of a ring of mountains (enclosing the elevated province of **Arcadia**) with

[1] See p. 246, *n.* 1.

[2] An Italian name signifying 'Black Mountain.' The native name, *Chernagora*, and the Turkish name, *Kara Dagh*, have the same meaning. The Italian name became current throughout Europe at the time when the Italians were the chief traders in the Mediterranean.

[3] An Italian form. See previous note.

[4] The *Pencios* or *Peneus* of the ancients.

finger-like ranges radiating outwards to the ends of the minor peninsulas in the south-east and south (in **Argolis**, **Laconia**, and **Messenia**). The loftiest of these outer ranges is **Taygetos**, which terminates in **Cape Matapan**, in the extreme south of Greece.

In the two mountain groups east of the Salonica-Belgrade road the trend of the mountains where they form a chain is more or less east and west. The most important of these chains is that from which the peninsula takes its name, the **Balkan Mountains**, a chain which for the greater part of its course separates the principality of Bulgaria from Eastern Roumelia, and forms the water-parting between the rivers on the north and south. Like the Pyrenees, this chain is remarkable for the great height of its passes relatively to the general height of the mountains, few of these—except in the east, where the chain sinks in elevation—being under 5,000 feet above sea-level. In the middle of the chain the most important is the **Shipka Pass**, between Philippopolis and Tirnova. West of the **Isker**, the only river which cuts across the chain (in a narrow defile affording no convenient route for traffic), the Balkans become less continuous, and trending more to the north-west almost merge in the mountains of Eastern Servia, which form a continuation of the Carpathians to the south of the Danube. From the Balkans these latter mountains are separated only by the valley of the **Timok**. The chief route between Bulgaria and Eastern Roumelia is situated west of the Isker.

In the angle between the routes from Constantinople and Salonica to Nish, the most important chain is that of the **Rhodope Mountains**, which run parallel to the Balkan at a lower elevation.

For **inland navigation** the frontier rivers on the north are much more important than any of the rivers in the interior; but a great hindrance to the navigation of the Danube exists in what is known as **The Iron Gate**, a narrow defile seventy-five miles in length, with rapids and rocky shallows, occurring where the Carpathians cross from Hungary into Servia, and terminating at Orsova, the Iron Gate proper, the most dangerous point in the whole defile, at the commencement of the Roumanian frontier.

The **climate** of the Balkan Peninsula is subject to greater extremes than that of the other peninsulas of the Mediterranean, and especially extremes of cold, in consequence of the fact that some of the plains and higher inland valleys are exposed to the

cold winds from the north-east. In most parts the rainfall is abundant and pretty equally distributed throughout the year. Only Greece and the western coasts have the nearly rainless summers characteristic of the Mediterranean, with the characteristic thick-leaved orange and olive trees.[1] In all parts the summer is warm enough for **maize** and **tobacco**, in the warmer valleys, also for **cotton**, and the fertile soil of the plains renders cultivation easy.

Forests of beech and oak, and, on the higher mountains, of firs and pines still cover vast areas, though in many parts (especially the north-west) they have been cleared, sometimes greatly to the injury of the country. The hill pastures, generally too meagre for horses and cattle, are better fitted for the smaller kinds of live stock, such as **sheep** (above all in Servia and Greece) and **goats** (in Greece, Bosnia, and Servia); and in some parts, particularly in Servia, immense numbers of **pigs** are reared on the mast of the forests. Horses and cattle are chiefly reared in the lower parts of Bosnia and Bulgaria, along the Save and the Danube.

Minerals are widely diffused but not much worked.

The density of the **population** is estimated at about seventy to the square mile, a low degree of density, ascribable partly to the extent of unproductive surface occupied by mountains, partly to the natural obstacles in the way of commerce, but chiefly to the long misrule to which the region has been subjected under the Turks. The densest population is in the low grounds north-west of Constantinople.

Judged by language, the inhabitants of the peninsula may be divided into four principal groups: (1) **Slavs**, making up more than half of the entire population, occupying all the northern regions, and divided into Bulgarians in the east, Servians in the west (in Bosnia, Herzegovina, and Montenegro, as well as in the kingdom of Servia); (2) **Arnauts** or **Albanians**, descendants of the ancient Illyrians, chiefly in the region between Greece and the area occupied by the Slavs—in the southern part of Albania (Epirus) Greek is now spoken, and hence the Greeks claim to have this portion of the province of Albania added to their kingdom; (3) **Greeks** in the kingdom of Greece, in the lowlands behind Constantinople, on the coast of the Ægean Sea and the Sea of Marmora, on the islands of the Ægean Sea and in Crete;

[1] See p. 185.

(4) **Turks**, the smallest division, mostly scattered over the area under Turkish rule as owners of the soil. Besides these there are many **Jews** and **Armenians** as traders in the towns.

As regards **religion**, the Slavs, except in Bosnia, and Greeks are for the most part adherents of the **Greek Church**, the Turks and a portion of the Albanians and Bosnians **Mohammedans**.

The highly mountainous character of the peninsula has always been an obstacle to its being under one political rule, and the peninsula has in fact never formed a single state by itself. At one period it formed a part of the Roman Empire, and later it was almost entirely brought under the sway of the Turks, when these were at the height of their power in the sixteenth and seventeenth centuries. Only Dalmatia remained in the possession of Venice till, about 1800, it fell into Austrian hands. Since the seventeenth century Turkey has been constantly losing ground, and now the peninsula is divided among four independent states, besides the coast strip of Dalmatia (part of the Austrian Empire), the provincec of Bosnia and Herzegovina under Austrian administration, though still nominally part of Turkey, and the principality of Bulgaria, which is tributary to Turkey, but otherwise independent.

States and Towns.—1. European Turkey, extending from the Adriatic and Ionian Seas to the Black Sea between Greece and the northern States. The total area now directly under Turkish rule is only about as large as the State of Wisconsin. The sovereign, who bears the title of **Sultan**, is an absolute monarch. By the Turks he is regarded as the *Caliph* or successor of Mohammed, and head of the Mohammedan religion (see p. 231).

CONSTANTINOPLE (875), the capital of the whole Turkish Empire, occupies one of the most favourable sites in the world, where the land route for the commerce between Europe and Asia is crossed by the sea route between the Black Sea and the Ægean,[1] and where the narrowness of the straits at either end of the Sea of Marmora renders defence easy. A small inlet from the Straits of Constantinople or the Bosporus,[2] forms an excellent natural harbour,[3] and confines the Turkish town proper, with its domes and minarets, its narrow streets and its gay bazaars,[4] to a triangular peninsula between it and the Sea of Marmora. The suburbs of **Pera** and **Galata**, occupied by foreigners

[1] See Introd. p. 61 (3). [2] Gr.='Passage of the ox,' equivalent to Ox-ford.

[3] The so-called Golden Horn.

[4] A Persian word applied in the East to a place where goods are exposed for sale. It is usually something like what in our towns is called an arcade—that is, a narrow street with rows of shops on either side and arched over, but frequently it is open or only shaded by some light material laid from roof to roof.

from Western Europe, and wearing a Western aspect, lie on the other side of this harbour. The importance of this site was early recognised by the Greeks, who founded here the colony of Byzantium in the seventh century B.C. This town was completely superseded by the city founded by and named after Constantine the Great, early in the fourth century A.D., the city which continued to be the capital of the Eastern Roman Empire till it was taken by the Turks in 1453.

Gallipoli, on the strait of the Hellespont (Dardanelles[1]), is the chief station of the Turkish navy. **SALONICA**, the second seaport in rank in the Balkan Peninsula, is likewise the second town in population; and the only other town with more than 50,000 inhabitants is **Adrianople**, situated at the point where the Maritza is joined by a

FIG. 50.—MOSQUE OF SULTAN ACHMED, CONSTANTINOPLE.

tributary on the left bank,[2] the valley of which leads up to the passes across the Eastern Balkans, and accordingly at the meeting-place of important roads from the north-east and north-west.

In the western province of **Albania**, chiefly a region of wild and precipitous limestone mountains, the most noted town is **Yanina**, occupying the site of the anciently famous oracle of Dodona, on a fruitful tableland of Epirus.

Of the **islands** subject to Turkey, the largest is **Crete** or **Candia**, facing the mouth of the Ægean Sea. Only its north coast is provided

[1] Properly the name of the fortresses erected by the Turks on both sides of the strait.

[2] The Tunja. See Introd. p. 61 (2) (*a*) and (3).

with numerous bays; and on one of these, near the middle, stands its capital, **Candia.**

2. Bulgaria is a principality with which the province of **Eastern Roumelia** is now practically united. The independence of the principality dates only from the Treaty of Berlin, 1878. The capital of the principality is **Sofia**; the chief town in Eastern Roumelia, **Philippopolis.** On the coast of Bulgaria is the fortified seaport of **Varna,** and on the right bank of the Danube—which, unlike the Roumanian or left bank, is high and not subject to inundation—are several towns of importance: **Widdin, Nicopolis, Rustchuk,** &c.

3. Servia, a kingdom situated to the west of Bulgaria. The inhabitants made themselves partly independent of Turkey early in the present century, and the independence was made complete and the territory of the state enlarged by the Treaty of Berlin. The capital is **Belgrade,** a strong fortress at the confluence of the Save and the Danube.

4. Bosnia and **Herzegovina,** with the district of **Novi-bazar,** lie to the west and south of Servia. They are rich in minerals, and have one or two fertile valleys, but their resources await development. The capital is **Serayevo,** in an expansion of the valley of the Bosna.

5. Montenegro, a natural stronghold in the south of Bosnia, where a Servian people has maintained its independence against the Turks since the fourteenth century. Its territory was enlarged by the Treaty of Berlin, which first gave the little principality (not much more than one-third the size of New Hampshire), a strip of coast. Capital, **Cetinye.**

6. Greece, a kingdom in the south of the peninsula, more than nine-tenths the size of Maine, with a population of 2,000,000. It achieved its independence of Turkey in 1830, and had its boundaries extended fifty years later, when the fertile wheat-growing valley of Thessaly and other districts in the north were added to it. The mainland is divided into two parts by the **Gulfs of Corinth** and **Ægina,** between which lies the **Isthmus of Corinth,** through which at its narrowest part (less than four miles) a canal navigable by the largest vessels is now being pierced.[1] A large part of the kingdom consists of islands, the largest of which is the long island of **Eubœa** or **Negroponte,** separated from the mainland only by the narrow channel of Euripus. The islands farther to the south-east are known as the **Cyclades,**[2] those farther north as the **Sporades,**[3] while those on the west of the mainland, together with **Cerigo** in the south, are called **Ionian Islands**—Zante, Corfu (Corcyra or Kerkyra), &c. Except in Thessaly, the most important products of Greece are olives, wine, and a small kind of dried grapes, which take the name of *currants* from the town of Corinth. From the nature of the surface, however, Greece has always been less a country of agriculturists than of seamen and merchants.[4] The capital and the only considerable town in the country is **Athens,** in the province of Attica, north of the Gulf of Ægina. Its citadel, called the Acropolis, is still crowned by some fine ruins, relics of the time when this small but famous city was at the head of civilisation, the home of

[1] A project originally started by the Roman Emperor Nero in the 1st century A.D.

[2] Gr. *kyklos*, a circle; so-called because they were imagined by the Greeks to form a circle round the sacred island of Delos.

[3] Gr. = the 'scattered' islands; so-called in contradistinction to the Cyclades.

[4] Compare Brittany Illyria, Norway (pp. 210, 246, 259).

artists, poets, and philosophers, who have been the admiration of all succeeding ages. At the present day it is the seat of a largely-attended university. Its port is the **Piræus**, with which it is now connected by railway. The anciently celebrated cities of *Argos*, at the head of the bay of Argolis, *Corinth*, on the isthmus, and *Sparta*, on the Eurotas, are now all insignificant places; and, besides Athens, the only towns on the mainland of any importance at the present day are **Patras**, on the southern shore of the Gulf of Corinth, with a large export of currants, and **Larissa**, on the Salamvria, in the plain of Thessaly. Of the towns on the islands, the most important is **Hermopolis**, on the island of Syra, a town with an excellent harbour, which, on account of its

FIG. 51.—ATHENS, WITH THE ACROPOLIS.

central situation[1] in the Ægean Sea, has become a much-frequented coaling station for steamers, as well as a busy centre of commerce; on the Ionian Islands, the most important town is **Corfu**, on the side of the island facing the Turkish province of Albania; besides being the centre of a considerable shipping trade, it is the seat of a university.

COLONIAL AND OTHER POSSESSIONS OF EUROPEAN POWERS.

Denmark.—Greenland and the West Indian islands of St. Thomas, St. John and Santa Cruz.

[1] See Introd. p. 61 (3).

France.—Immediate Possessions: Algeria; the territory on the Senegal and Gambia, the territory between the Gaboon and the Congo, the islands of Ste. Marie and Nossibé near Madagascar, Mayotte, Comoro Islands, and Réunion or Bourbon; Obock and the neighbouring part of the coast of the Gulf of Aden; Pondicherry, Chandernagor, Carical, Mahé, and Yanaon in India; the Society Islands, including Tahiti, the Marquesas, and some other islands in the Pacific; Saigon or French Cochin-China, Cambodia, and Tongking in Indo-China; New Caledonia, the North American islands of St. Pierre and Miquelon off the Newfoundland coast, the West Indian Islands of Martinique and Guadeloupe, part of St. Martin and some smaller islands; French Guiana or Cayenne. **Protectorates:** Tunis, the island of Madagascar, and the empire of Anam.

Germany.—In West Africa, Togo Land in Upper Guinea, the coast of the Bight of Biafra, the coast from Cape Frio to the Orange River with the exception of Walvisch Bay; in East Africa, the territory of Usagara, &c., behind Zanzibar; in the Pacific Ocean, the north-east of New Guinea, the Bismarck Archipelago (composed chiefly of the islands formerly known as New Britain, New Hanover, and the Admiralty Islands to the north of New Guinea), and the Marshall Islands in Polynesia.

Great Britain.—See page 194.

Italy.—Assab, Massana, and other parts of the African coast of the Red Sea. **Protectorate:** Abyssinia.

Netherlands.—Java, Madura, and other possessions in the Eastern Archipelago; Surinam or Dutch Guiana and the West Indian islands of Curaçao, Bonaire, Aruba, &c.

Portugal.—The African islands of the Azores, Madeira, Cape Verde, St. Thomas, and Prince's Island (Principe), a small part of the coast of Senegambia, Lower Guinea from the Congo to Cape Frio, the East African coast from Delagoa Bay to Cape Delgado; Goa, Salsette, Bardez, Daman, and Diu in India; Macao off the south-east coast of China, and part of the island of Timor in the Eastern Archipelago.

Russia.—Siberia, the Trans-Caspian territory, Russian Central Asia, and the lieutenancy of the Caucasus.

Spain.—Ceuta and several stations known as the Presidios on the coast of Morocco, the Canary Islands off the north-west coast of Africa, the islands of Fernando Po and Annobon off the coast of Guinea, and some smaller possessions on the same coast; the Philippine and Sulu Islands, belonging to the Eastern Archipelago; the Caroline, Ladrone, and Pelew Islands in the Pacific; and the West Indian islands of Cuba and Porto Rico. Spain also claims a protectorate over the west coast of Africa (desert of Sahara) from Cape Bojador to Cape Blanco.

Turkey.—Immediate Possessions.—Asia Minor, Syria, Mesopotamia, and parts of Arabia; Tripoli. **Protectorates:** the tributary principality of Samos in the Ægean Sea, the viceroyalty of Egypt.

The British and Russian possessions outside of Europe are the only ones which contain extensive territories suitable for colonisation by the inhabitants of the mother countries. There are a few French colonists in Algeria.

ASIA.

Approximate latitudes: Cape Chelyuskin, 78° N.; (north of Lake Victoria Nyanza), Cape Romania, 1° N.; (mouth of San Francisco River, north of Lake Nyassa) south of island of Timor, 10° S.
Approximate longitudes: west coast of Asia Minor, 27° E.; East Cape, Behring's Strait, 170° W.

Asia, the largest of the continents, has an area of upwards of seventeen million square miles, or about five times that of Europe, the smallest; while the estimated population, about 800 millions, is only about two and one third times that of Europe. In comparing the position of these two continents, it is most instructive to follow the parallel of 40° N., which in the west of Europe has Madrid immediately to the north of it, in the east of Asia has Peking immediately to the south of it. Whereas therefore this line cuts off only relatively small areas in the south of Europe, it divides Asia into two nearly equal parts; and the contrast as regards the distribution of population is much more striking, inasmuch as less than one-twentieth of the population of Europe dwells to the south of that line, which in Asia has a much smaller fraction of the population on the north.

The chief point of correspondence in outline between the two continents lies in the fact that in both there are three great peninsulas in the south, Arabia, India, and Indo-China, corresponding to the Iberian Peninsula, Italy, and the Balkan Peninsula. In Asia, however, all is on a larger scale. The Arctic coasts of both continents are similar.

The islands and peninsulas on the east side of Asia enclose several border seas more or less cut off from the main body of the ocean, though none of them to so great a degree as the Baltic and the Mediterranean in Europe. The **Sea of Okhotsk**, between the peninsula of Kamchatka and the mainland, though an inland sea, may be most usefully compared with the part of the Arctic Ocean between Scandinavia and Iceland, since it is cut off from the Pacific by a submarine bank[1] the situation of which is marked

[1] See Introd. p. 24.

by the line of the Kurile Islands. The **Sea of Japan**, between the islands of Japan and the mainland, naturally falls to be compared with the North Sea of Europe (the peninsula of Korea answering to that of Jutland); but this difference must be noted, that the elevation of the sea-bed to the extent of 600 feet, though it would unite the islands to the mainland, would leave a deep inland lake occupying the greater part of the area where the sea now lies.[1] The **Yellow Sea**, farther south, between Korea and China, together with the **Eastern Chinese Sea** at its mouth, would all be converted into dry land by a similar elevation, and so also would the **Gulfs of Tongking** and **Siam** (respectively north-east and south of Indo-China), while the land on the south-east of Indo-China would stretch out so as to enclose all the larger islands near (Borneo, Sumatra, and Java, with Bali).[2] To connect these with the mainland a much slighter elevation of the sea-bed would suffice than in the case of the archipelago of the Ægean Sea. As to the storms of Asiatic seas, see Introduction, p. 41.

As regards **surface**, there are two important points of agreement between Europe and Asia. (1) In both continents the highland regions lie chiefly in the centre, and in the southern peninsulas, while the greater part of the north is a plain. In the case of the southern peninsulas the character of the surface increases the correspondence between Europe and Asia; Arabia being like Spain, a region of arid plateaux, India like Italy, composed of a mountainous region in the peninsula proper, cut off by wide alluvial plains from a continuous barrier of mountains in the north, Indo-China, like the Balkan Peninsula, a mass of irregularly distributed mountains associated with equally mountainous islands.

(2) In both continents the principal mountain chains trend more or less east and west. Only in the north-east do they assume a more northerly trend like that of the Ural Mountains.

There are, however, three important points of difference. (1) The mountain ranges of Asia are not only, as might be expected from the greater size of the continent, of much greater extent than those of Europe, but also of much greater height. The **Himalayas**, in the north of India, are the highest mountains in the world. **Mount Everest**,[3] the highest known peak in the chain, attains a height of 29,000 feet or more than five miles, and besides it there are in the southern or

[1] Comp. p. 182. [2] A deep strait separates Bali from Lombok.

[3] Sometimes called *Gaurisankar*, though it is doubtful whether this native name properly belongs to Mount Everest.

higher of the two chains of which it is composed seventeen peaks of more than 25,000 feet in height, and accordingly, all higher than the highest of the Andes of South America, the next highest range in the world.[1]

(2) The extent and height of the plateaux of Asia are enormously greater than those of Europe. The whole of Central Asia is indeed a series of lofty plateaux varying from 2,000 to 20,000 feet in height, enclosed and partly cut off from one another by mountains, the chief of which take their origin in an elevated region to the north-west of India (about 72° E.) From this centre the **Himalayas** proceed south-eastwards, the **Karakorum** Mountains (by some regarded as a third chain of the Himalayas) for a shorter distance in the same direction; the **Kuen-lun** Mountains proceed east and slightly south; the **Tian-Shan** Mountains more towards the north-east.

(3) While all the great mountain ranges of Europe form water-partings, those of Asia are frequently pierced by river valleys, and hence many of the mountain passes of Asia are not across the heads of valleys but through narrow defiles along river-banks or in their neighbourhood. The southern chain of the Himalayas is broken up by river gorges into a great number of sections, while the two greater rivers, the Indus and Brahmaputra, cut right across the whole system.

The **principal rivers** of Asia are necessarily of much greater length than those of Europe. All except those of the Siberian plains rise in the central plateau and flow east, south-east, or south to the Pacific and Indian Oceans; and these all belonging to the monsoon region[2] are all liable to overflow their banks in summer, while at all seasons of the year they are fed with copious supplies of water from the elevated areas in which they have their head-streams. In the interior, both on the high plateau from which the encircling mountains cut off the supplies of rain,[3] and in the plains of the west, between the Caspian Sea and the mountains, there are numerous rivers which after a longer or shorter course dry up in sandy deserts, their water being partly absorbed by the porous soil, partly evaporated. Such rivers are, however, of the highest importance, since on their banks are found fertile oases, sometimes with large towns for their centres.[4]

The **fresh-water lakes** of Asia are relatively of far less importance than those of Europe. The largest, **Lake Baikal**, on the Siberian slopes of the mountains in the north-east, is nearly twice the size of Lake Ladoga;[5] but there is no lake-studded district in Asia like that of Finland and Scandinavia,[6] or even like that of the Alps in Europe. On the other hand, there are large inland seas of salt or brackish water, besides an immense number

[1] See section across Asia, p. 63. [2] See pp. 42, 51. [3] See p. 32.
[4] See pp. 294, 305, 328. [5] Or of Lake Ontario. [6] Or of Minnesota.

of small salt lakes in the low-lying region adjoining Europe south of the Ural Mountains, and other salt lakes elsewhere. The **Caspian Sea**, 170,000 square miles in area,[1] is the largest inland sheet of water in the world. The **Sea of Aral** (rather more than twice the size of Lake Baikal) is inferior in size only to the largest lakes of Africa and America,[2] **Lake Balkhash**, about one-seventh larger than Lake Ladoga.[3]

From its most easterly position, Asia[4] has a **climate** subject to greater extremes of temperature than Europe.

The mean temperature of the year is everywhere lower than in corresponding latitudes in the western Continent, the mean temperature of January, the coldest month, relatively still lower, but the mean temperature of July, the hottest, everywhere higher, notwithstanding that on and near the east coast the sea has a certain effect in moderating extremes. Owing to the great width from east to west of the land-mass to which it belongs, the coldest area in the world lies towards the north-east of this continent, and it is a fortunate thing for that part of Asia which lies to the south that the mountains intervene to shelter it from the cold winds that would otherwise sweep down on it from this area.

The **rainfall** is insufficient, not only, as already intimated, in many parts of the interior, but also in the south-west (as far east as the Indus valley), where the southerly winds of summer blow not over the ocean but over Africa or both Africa and Arabia. On the other hand, in the monsoon region in the south-east, and especially in the tropical portion of it, the rainfall is very abundant.

The region just referred to, including the whole area from India to the north of China, together with the islands of the Eastern Archipelago and Japan, is that which contains the great mass of the Asiatic population. It comprises, according to the best estimates, seven-eighths of the inhabitants, although not very much more than a quarter of the area. In the rest of Asia, the average density of the population is only about eight to the square mile, or about half that of Norway; the principal parts in which a greater density is found are the western skirts of the central tablelands and some districts in Asia Minor.

Most of the **inhabitants** of Asia belong to **two types**, the **Mongolian** and **Caucasian**, the former characterised among other things by yellow complexions without ruddy tinge, small almond-shaped obliquely set eyes and high cheek-bones; the latter by a fair complexion usually with a ruddy tinge, low cheek-bones, and round eyes set straight. Of the Mongolian type (most abundant in the east) the Chinese are the most numerous representatives,

[1] More than five times the size of Lake Superior. [2] Lake Superior and Victoria Nyanza only are larger. See pp. 115, 331. [3] See p. 250. [4] See Introd. p. 61.

as the Hindus are of the Caucasian. Each type is broken up into great groups the languages of which are entirely distinct from each other, while the groups are themselves subdivided into smaller groups speaking allied languages.

Among the races of the Mongolian type, the most important of the great groups are the Chinese and Anamese, the Finno-Tatars, inhabiting Siberia and Western Asia, and the Malays[1] in the south-east. Of those of the Caucasian type, the chief great linguistic groups are the Aryan (comprising Hindus and Iranians), and the Semitic (of which the Arabs are now the principal representatives). To this type belong also the majority of the inhabitants of the Caucasus (whence the name Caucasian).

As regards religion, Asia is remarkable as the cradle of all the great religions of the world—Judaism, Christianity, and Mohammedanism; Zoroastrianism, Brahmanism, Buddhism; and three of these (the first three) arose among Semitic peoples, the others among Aryans. **Brahmanism** or Hinduism, **Buddhism**, and **Mohammedanism** are now the prevailing religions, the first in India, to which it is confined, the second throughout the monsoon area except in India, the land of its birth, and the third in western Asia and partly in India and the Eastern Archipelago.

Of these religions, Judaism, Christianity, and Mohammedanism all agree in declaring the existence of one Supreme Being, and are hence known as monotheistic religions. **Mohammedanism** takes its name from Mohammed, an Arabian who founded this religion early in the seventh century of our era. The most noteworthy effects of Mohammedanism on the life of its professors arise from its recognition of polygamy, its prohibition of the use of wine (a prohibition observed in some Mohammedan countries with great strictness, in others scarcely regarded at all), and its injunction on all its followers to make a pilgrimage to the sacred city of Mecca (see Arabia, p. 303) at least once in their lives. In some Mohammedan countries, those who have made this pilgrimage are distinguished by a peculiar dress. In all the more civilised Mohammedan countries, the *mosques* or temples are a striking feature, and are generally distinguished by the possession of tall slender towers called minarets, from which a crier (muezzin) calls the people to prayer (see cuts, p. 282 and p. 314).

Brahmanism or Hinduism is the ancient religion of the Hindus, and, though possessing sacred books of an exalted character, is in its present degraded form chiefly characterised by the worship of innumerable idols and the observance of caste distinctions, in consequence of which different sections of the people are kept entirely separate from one another, intermarriage being prohibited, and members of one caste not allowed to follow callings peculiar to another. The four original great castes of the Brahmans or priests, the Kshatriyas or warriors, the

[1] See pp. 319, 346.

Vaisyas or merchants and tillers of the ground, and the Sudras or labourers, have in process of time been subdivided into a great many minor castes, the isolation of which is often as strictly maintained as that between the great castes. Pariahs or those who are members of no caste are treated with contempt by all who can claim to belong to any caste, even the lowest.

Buddhism derives its name from the epithet Buddha, meaning enlightened, applied to the founder of this religion, who lived in the fifth or sixth century B.C. The religion he taught was meant to be a reform of the corrupt form of Brahmanism which then prevailed in India, and was specially directed against idolatry and the observance of caste. He endeavoured to substitute for the Brahmanism of his time a lofty system of morality, in which the virtues of gentleness and kindness to animals were particularly enforced; but at the present day the chief outward signs of the observance of this religion are the numerous (often colossal) statues of Buddha, the *dagobas* or *pagodas* erected to enshrine relics of Buddha (see cut, p. 318), and the monasteries in which the swarms of yellow-robed priests or *bonzes* generally dwell.

Zoroastrianism is the religion of the ancient Persians, and is now almost extinct, having only a few professors in the heart of Persia and in Bombay, and one or two other towns in India. They believe in the existence of a good and an evil deity, and are sometimes called fire-worshippers, because they regard light and fire as symbols of the former. In India they are known as Parsis.

ASIATIC COUNTRIES.

I. *COUNTRIES OUTSIDE OF THE MONSOON REGION.*

1. **SIBERIA** is the Asiatic continuation of the more northerly parts of Russia in Europe, and in the north-west is politically as well as physically separated from Russia in Europe by the Ural Mountains, which in this part of their extent have a much more abrupt slope on the Asiatic side than on the European side. Its area is not far short of five millions of square miles, and about five millions make up the number of its settled population—a result chiefly of its severe climate, but partly also of its remoteness from the chief seats of civilisation.

Plains occupy the greater part of the west, but mountains and hills cover a considerable area in the east, and more especially the south-east (**Yablonoi** and **Stanovoi** ranges). Amidst these mountains, partly on the Chinese frontier, flows the navigable **Amur**. Mountains also occupy the southern frontier as far west as the 80th meridian of east longitude. Among these are the **Altai** and other mountains, the northern spurs of which are rich in

minerals (silver-yielding lead, graphite,[1] coal, &c.). Siberia also yields abundance of ivory derived from the tusks of the mammoth or woolly elephant, now extinct.[2] The New Siberian Islands, off the mouth of the Lena, are specially rich in these remains.

The aspect of the vegetation is similar to that of the corresponding parts of Russia in Europe. In the north is a vast area of **toundras**, extending in some parts almost to 60° N. There then follows an area of forests and marshes with fur-bearing animals, an area traversed by magnificent navigable rivers draining into the Arctic Ocean—the **Ob** or Obi and **Yenisei** in the west, the **Lena** in Eastern Siberia. Only in the southern parts of Western Siberia is there land suited for agriculture, and here, among the valleys opening out from the central highlands of Asia, there are some deposits of rich black soil such as is found in Southern Russia.[3] There chiefly lies the hope of the future development of Siberia, when it has been brought into more intimate connection with the commerce of Western Europe. Severe as the winter is (too cold for European fruit-trees), the summers are not only suitable for the growth of wheat, but even warm enough for melons to ripen in every Siberian garden.

The great defect of Siberia at present is the want of communications. There are few roads, and no railways. The navigable rivers are hence invaluable for commerce, and, above all, the rivers of the Ob and the Yenisei basins, which are made use of in the overland trade (in tea, woollen goods, and furs) between Russia and China. Near the right bank of the **Selenga**, in the south-east of Lake Baikal, lie the two adjoining towns where the products of the two empires are exchanged—**Kiakhta**, on the Russian, **Maimachin**, on the Chinese side of the frontier. Thence the products are conveyed by the navigable Selenga to Lake Baikal, and thence chiefly by water to **Tobolsk**, the nearest town on the Irtish, to the southern passes across the Urals.[4]

Important as these highways of commerce are, they are subject to the drawback that they can be used only for part of the year, the rivers being frozen over for a longer or shorter time in winter, in some parts for nearly six months. Hence the breaking-up of the ice at the end of winter is the most important event of the year in Siberia, and the spectacle then produced on the Siberian rivers is on a scale of grandeur corresponding to its importance. The break-up of the ice begins in the

[1] Exported to Nürnberg, in Germany, for the making of lead pencils.

[2] Entire carcases of this long extinct animal have been found preserved in the frozen ground of northern Siberia.

[3] See pp. 251-2.

[4] The sea-route to the mouths of the Siberian rivers which the Swedish navigator Nordenskiöld maintained to be practicable, after his voyage round the north coast of Europe and Asia in 1878-79, has not yet proved commercially successful.

south, and so rapidly does it proceed that the lower parts of the rivers, still dammed by ice, are unable to carry off the water, which consequently streams swiftly up the tributaries laden with numberless ice-blocks. Backwards and forwards the water sways for days together, until, under the influence of the south winds, the ice melts away, and the long winter is followed at a bound by the long summer.

To increase the utility of the river trade-route the railway from Perm to Ekaterinburg (entirely in European Russia) is at present being continued to the point in Siberia at which the river navigation begins, and a canal is being cut to connect the basins of the Ob and Yenisei.

The inhabitants of Siberia are partly native, partly colonists from Russia, partly Russian convicts and political offenders, who have been deported thither.

The native inhabitants are chiefly of the Mongolian type and members of the Finno-Tatar family. In the north they are fishers and hunters, and are mostly heathen; in the south, nomadic herdsmen, followers of Mohammed. The colonists lead a settled life, are chiefly engaged in agriculture and mining, and the same occupations are pursued under comparatively little restriction by numbers of the deported population.

The principal tribes in the extreme north are the Samoyedes, Tunguses, Yakuts, Yukaghirs, and Chukchis, occurring in that order from west to east. Farther south in the west are the Ostyaks and Kirghiz.

All the chief towns stand on the great rivers and their navigable tributaries. The largest is **Irkutsk**, on the Angara, a tributary of the Yenisei, a little below its issue from Lake Baikal, hence an important station on the trade-route between Russia and China. **Yakutsk**, on the Lena, at the point nearest the Sea of Okhotsk, is an important centre for the fur trade. **Tomsk**, on the Ob, the chief centre of the gold-washers.[1] It is now the seat of a university. **Tobolsk**, see above.

2. RUSSIAN CENTRAL ASIA.—The territory lying to the south of the Ural Mountains, east of the Caspian, west of the Chinese Empire, and north of Persia and Afghanistan, comprises an area of about one-and-a-half million square miles, with a population of less than five millions. This population is chiefly collected in the south-east, where the valleys opening out from the Tian-Shan Mountains, contain the most fertile and best watered soil, and where accordingly there is a settled population pursuing agriculture. Farther to the north and west agriculture can be carried on only in the neighbourhood of rivers, which supply water for irrigation, and the chief towns are the centres of oases seamed with canals, led from the rivers for that purpose.

[1] That is of those who obtain gold from earthy matter by washing away the lighter material with which it is mixed, as distinguished from those who obtain it by the crushing of quartz reefs.

The principal rivers are the **Ili**, which finally flows through a swampy delta into Lake Balkhash; the **Sir**,[1] which flows into the north, the **Amu**,[1] which flows into the south of the Sea of Aral; the **Zerafshan**, which rises among the southern mountains, but after a westerly course dries up in the sands; and the **Murghab**, which enters this region from Afghanistan in the south, and also dries up. On or near the Sir stand **Khokan** and **TASHKENT**, the latter the principal town in Central Asia; near the Amu, **Khiva**; on the Zerafshan, **Samarkand** and **Bokhara**; on the Murghab, **Merv**.

The greater part of the region consists of steppes, roamed over by nomadic tribes (Kirghiz, &c.), who dwell in felt tents, called yurtas, and rear horses, cattle, and camels. Mohammedanism is the prevailing religion.

FIG. 52.—A YURTA OR FELT TENT OF CENTRAL ASIA.

Most of this territory is under Russian sway, and even where not directly subject to Russia is under Russian influence. A railway (the Trans-Caspian Railway) has been constructed by the Russians from the Caspian Sea south-eastwards near the line of the Persian frontier, and then across the desert north-eastwards to Merv; and when completed the railway will extend to Samarkand.

3. CAUCASIA AND ARMENIA.—These are mountainous territories lying to the south-east of Russia in Europe, between the Black Sea and the Caspian. Caucasia takes its name from

[1] To these names the word *Darya*, meaning 'river,' is often added.

the **Caucasus Mountains**, a range which stretches from west-north-west to east-south-east for a distance of 700 miles, and has several summits above 16,000 feet (**Elbruz**, 18,500 feet). The **principal pass** in the chain lies about the middle, just to the east of Mount Kazbek, and is now crossed by a well-made Russian road leading from Vladikavkas[1] on the north through the **gorge of Dariel** to Tiflis in the south.

The western half of the chain is the narrower, the eastern half spreading out to a considerable extent on the north, where it consists of an assemblage of lofty plateaux, natural fortresses bounded by huge precipices, which are washed at their base by torrents.

A still greater contrast is presented by the north and south. On the north, steppes occupied by nomads and their herds come close up to the base of the mountains, while on the south, protected by the mountain barrier from cold winds,[2] and hence from winter frosts, the orchards of the lower slopes are succeeded by vineyards, cornfields, and pastures in rich alternation. Steppes are found on this side only in the eastern lowlands, while in the west, where summer rains are drawn from the Black Sea with the regularity of the monsoon area,[3] dense forests advance to the water's edge and leave little room for man.

The southern limit of the Caucasus is formed by the valley which bounds the Armenian plateau on the north, and is traversed by two rivers flowing in opposite directions—the **Rion** (ancient Phasis[4]) to the Black Sea, and the **Kur** to the Caspian. A railway, the highest elevation of which is about 2,400 feet, now traverses this valley from end to end, from the ports of **Batum** and **Poti**, on the Black Sea, to **Baku**, the centre of a district rich in **petroleum**, on the Caspian. The petroleum is used as fuel in working the engines on the Trans-Caspian railway. In the west of the Caucasus, north of the main chain, there is another supply of petroleum, less abundant, but more important in the commerce of the west, since the petroleum is conveyed by a pipe to a small port on the Black Sea.

The **Armenian Plateau** is composed of a series of mountain-traversed table-lands, two of which are so completely isolated as to be occupied by salt lakes[5] (**Van** and **Urumia**). **Lake Gokcha** is almost completely enclosed by mountains, from which it receives numerous influents on all sides, but it has an outlet to the Aras (tributary Kur), and is therefore fresh. Among these table-lands are the head-waters, not only of the Kur and its tributary the

[1] The terminus of a line of railway connected with the railway system of Russia in Europe.

[2] See Introd. p. 52, and the pages referred to in the note.

[3] See Introd. pp. 42, 51, and p. 306.

[4] Traversing the country whence the *pheasant* or *Phasian* bird was introduced into Europe.

[5] See Introd. p. 81.

Aras, but also of the Tigris and Euphrates. The table-lands are mostly steppe-like in character, and hence the occupations of the people are mostly pastoral; but agriculture is also largely pursued, and fruit-trees[1] are abundant.

The isolation both of the valleys of Caucasia and the table-lands of Armenia is illustrated in several ways by their inhabitants and their fauna.[2] The Caucasus is inhabited by a large number of tribes belonging to the type which takes its name from this region, but speaking languages wholly distinct from those of the Aryan stock, and even in some cases from each other. Independent, and lovers of freedom, like all mountain tribes, they have been brought under one rule only through being conquered by Russia in the present century after fifty years of conflict, and one of the chief tribes, the Circassians, rather than submit to the Russian yoke, migrated to Turkey and settled there among fellow-Mohammedans. Among the animals of the Caucasus are the European bison, elsewhere extinct except in the forests of Western Russia, the chamois, and a peculiar kind of ibex, one of the highest of mountain-climbers.

The **Armenians**, another people of Caucasian type, are peculiar both in language and religion, the latter being an ancient and independent branch of Christianity. Cattle-rearers and tillers of the ground at home, they emigrate in large numbers, and are among the principal traders of the Levant. The Armenians have never obtained political unity, however, nor have they been able to keep out foreign elements from their isolated table-lands, which are in many places the haunts of nomadic plundering **Kurds**.

At present Armenia is divided among three states, all the three divisions meeting in **Mount Ararat**, an extinct volcano 17,000 feet high. The northern division, with the town of **Erivan** and the fortress of **Kars** in the west, and the Aras region in the east, belongs to Russia; the south-western division, with Lake Van and **Erzerum**, the chief town on the trade-route between Trebizonde and North-western Persia, to Turkey;[3] the south-eastern division, with Lake Urumia and the town of **TABRIZ**, to Persia.

The whole of the Russian territory in this part of Asia forms the **Lieutenancy of the Caucasus**, which is divided into **Cis-Caucasia**, north of the Caucasus Mountains, and **Trans-Caucasia** (including Russian

[1] The apricot is a native of this region, and was introduced thence into Southern Europe in the fourth century B.C.

[2] A collective name for the animals of a region.

[3] Comp. p. 305.

Armenia), to the south of that chain. The seat of government is **TIFLIS**,[1] occupying the centre of a rich valley, and, as already indicated, at the point where the main road through that valley is crossed by the only road across the Caucasus.

4. **TURKEY IN ASIA.**—The territory under Turkish rule in Asia comprises Asia Minor with part of Armenia (see p. 295), Syria, Mesopotamia, and parts of Arabia (see p. 302).

Asia Minor is a plateau upwards of 3,000 feet in height bordered on the north and south by mountain chains parallel to the sea-coast, but opening on the west by numerous valleys, the submerged portions of which, as in the opposite Balkan Peninsula,[2] now form gulfs lying between rocky promontories and behind a breastwork of islands. The principal continuous mountain range is that on the south, the **Taurus**, which follows the windings of the coast, till in the east it turns inland north-eastwards, and is succeeded by the lower range of the Anti-Taurus. In the portion that trends northwards are the gorges known as the **Cilician Gates**, which afford a passage into Syria for the commerce of the west and north of the table-land.

Towards the south coast flow only a large number of mountain torrents from the Taurus range, the general slope of the plateau (except in the west) being towards the north, where the **Halys**, or **Kizil Irmak**,[3] pierces the mountains before entering the Black Sea by a delta. On the west the principal river is the **Menderes**, ancient *Meander*, which on account of its numerous windings has given a word to the English language. At the broadest part of the peninsula the drainage of the interior is inland, and here a large salt desert has at its lowest part a long and shallow salt lake.

This salt desert is the most arid part of the peninsula, but the rainfall is scanty everywhere within the border mountains. Only in the western valleys, where the rivers afford the means of irrigation, does cultivation ascend far into the interior, and there the products are those of the warmest parts of the Mediterranean peninsulas—not only sweet wine, olives, oranges, and other southern fruits, but also tobacco and cotton, as well as mastic.[4] On the inland steppes sheep are reared, and the district of Angora adjoining the salt steppe on the north is famous for a silky-haired race of goats (whence Angora wool).

[1] See Introd. p. 61 (8) (*b*).
[2] See p. 277.
[3] Turkish = 'Red River.'
[4] A kind of resin.

The inhabitants of the interior are chiefly Turks; on the coasts, where the largest towns have always been situated, are still many Greeks, as there were in ancient times. Of the coast towns now existing the most important is **SMYRNA**, at the head of a deep inlet about the middle of the west coast. It is the last survivor of a number of ancient seaports (*Miletus*, *Ephesus*, and *Phocæa*), most of which have decayed through the silting up of their harbours.[1] A railway now proceeds from Smyrna inland as far as **Alashehr**, from which point now start the camel caravans that cross the interior. **Konieh**, on the south-west of the inland salt steppe, is the meeting-place of the chief caravan routes. **Brussa**, a little to the south of the Sea of Marmora, is celebrated as having been the capital of the Turkish Empire before the Turks gained a footing in Europe. **Scutari**, on the Bosporus, is a suburb of Constantinople.

Of the islands, **Samos**, about the middle of the west coast, is tributary to Turkey, but otherwise independent. **Cyprus**,[2] off the south coast, about half the size of Wales, consists of a rich plain, furnishing wine, cotton, mastic, and other products, stretching between two bays in the east and west and ranges of mountains in the north and south. It is now under British administration, though still nominally a part of the Turkish Empire. Its capital is **Levkosia**, or **Nicosia**, in the plain; its chief port, **Larnaca**, on a bay in the south-east.

Syria and Palestine.—This portion of Asiatic Turkey consists mainly of a limestone plateau, but the southern two-thirds of it is divisible into four longitudinal strips running parallel to the eastern shores of the Mediterranean Sea. In the west there is a plain, extremely narrow in the north (the ancient Phœnicia), broader to the south of Mount Carmel (the fertile plain of Sharon), and still broader farther south, where the coast trends south-westwards towards Egypt, and the interior (the land of the ancient Philistines) becomes first steppe-like[3] and then desert. East of the plain the ground rises rapidly in the north to the chain of the **Lebanon Mountains**, which are followed on the south by an almost continuous plateau. The next strip on the east is a long valley, which in the north, between the ranges of Lebanon and Anti-Lebanon, is above the level of the sea, but rapidly falls below that level in the portion known as the **Ghor**. In this valley rise all the chief rivers. The **Orontes** flows northwards and finally westwards round the northern extremity of a continuation of

[1] Smyrna owes its continued existence to the fact that the river which enters the inlet on which it stands enters not at the head of the inlet but on the north side, where its deposits have extended the coast-line without blocking up the entrance to the gulf.

[2] Anciently rich in copper, this island derives its name from the Greek word for that metal.

[3] See Introd. p. 58.

Lebanon; the **Leontes** southwards and then westwards round the southern extremity of the same range; and the **Jordan**, suddenly emerging from underground as a full-bodied stream,[1] proceeds southwards with a rapid fall through the Ghor, traversing in succession the fresh-water lakes of **Huleh** (Merom) and **Galilee** (the latter nearly 700 feet below sea-level), and ends in the **Dead Sea**, a sea remarkable for the intense saltness of its waters as well as for the fact that it occupies the deepest depression on the land surface of the earth (the surface of the sea 1,300 feet below that of the Mediterranean). South of the Dead Sea the Ghor gradually rises in elevation till the ground again reaches a higher level than that of the Mediterranean.

The fourth longitudinal strip is another plateau which gradually passes eastward into a desert.

From a remote period a land of Semites, first of Jews and then of Arabs (whose language has been the prevailing one since about the eighth century), Syria is a country of peculiar interest to all the civilised nations of the West, as the home of the Judaic religion and the birthplace of Christianity. To the adherents of both these religions **Jerusalem** is a sacred city. It stands at the height of 2,500 feet above the sea on a plateau west of the mouth of the Jordan. Not less sacred to Christians is **Bethlehem**, the birthplace of Christ, three miles to the south. Several of the other important towns are also well known from the sacred writings of the Jews and Christians; among these, **DAMASCUS**, 'on the banks of Abana and Pharpar lucid streams,' a city occupying a site of rare beauty and fertility, with such geographical surroundings that it has been a place of importance from the very dawn of history. The Abana of Scripture, now the Barada, besides endowing its environs with luxuriant verdure, is the source of its commerce, inasmuch as in breaking through the range of Anti-Lebanon it opens up a pass by which in ancient times the traffic of the West was brought from *Tyre* and *Sidon*,[2] as it is in modern times from **Beirut**. Landwards, caravans proceed north, east, and south, across the desert. **Haleb**, or **Aleppo**,[3] 200 miles farther north, occupies an oasis situated about midway between the Mediterranean and the Euphrates, where that river in its middle course approaches nearest to the sea, and has hence been a trade-centre from time immemorial. In ancient times the seaports on this route were *Antioch*, on the Orontes, and *Seleucia* on the coast; the modern seaport is **Alexandretta** or **Iskenderun**,[4]

[1] See Introd. p. 29.

[2] The harbours of Tyre and Sidon have been destroyed by the rise of the land on this part of the Syrian coast.

[3] The latter name, an Italian form, is another survival of the former predominance of Italy in the commerce of the East (see p. 278 *n.* 2). Before the discovery of the seaway to India the Venetians had forty large trading-houses in Aleppo.

[4] Both names, the latter Turkish, derived from Alexander (the Great).

on the gulf of the same name, in the angle between Syria and Asia Minor. Along one of the routes connecting Aleppo with the sea it has frequently been proposed to construct a railway.

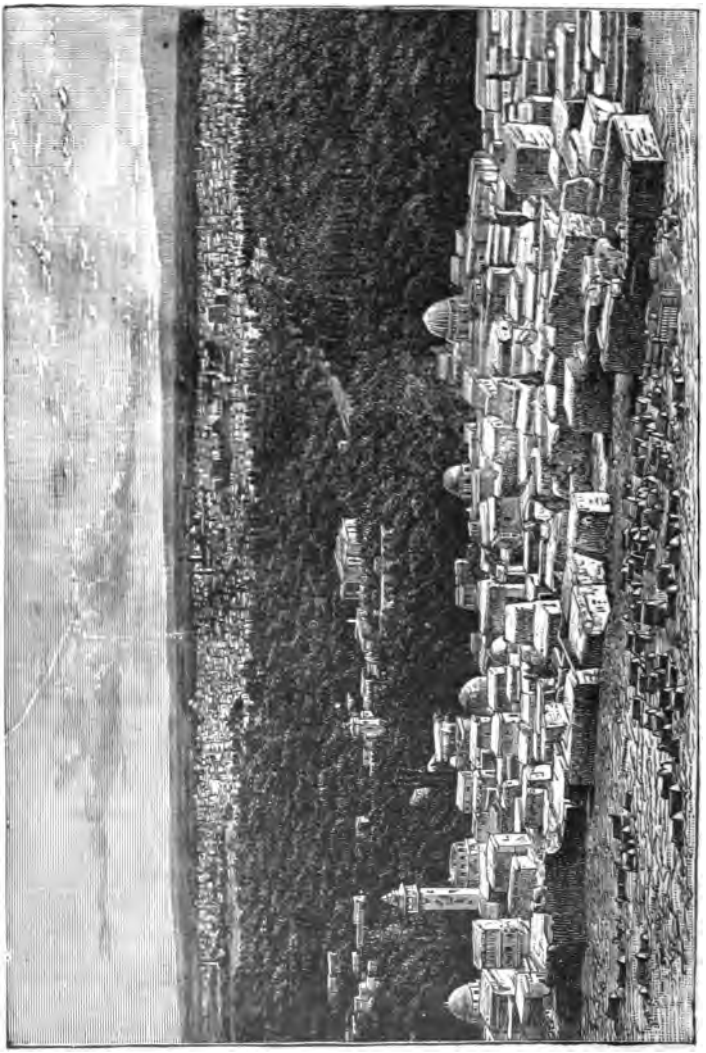


FIG. 58.—DAMASCUS. (By the kind permission of Messrs. Nelson and Sons.)

Mesopotamia.—Both this name, derived from the Greek, meaning 'the middle of the rivers,' and the Arab name **El Jezireh**, meaning 'island,' refer to the two great rivers **Euphrates** and **Tigris**, by which in fact the region is almost islanded. These two rivers, after quitting the Armenian plateau, first diverge but afterwards approach one another to within a distance of about thirty miles, and ultimately unite to form the **Shat-el-Arab**. In ancient times the two streams flowed separately into the Persian Gulf instead of uniting. To these streams the region owes all its fertility. The rains are too scanty for agriculture, but the inundations due to the melting of Armenian snows annually cover the adjoining surface with layers of rich soil, and at the same time supply the necessary moisture, and at an early date taught the dwellers on the banks of the rivers to use their waters more effectually by means of irrigation canals. Hence this region has always been occupied at least by a tolerably dense population, and the density has reached at different times and at different places a very high degree round great towns which arose on or near the banks of one of the rivers and became the centres of powerful states.

On the Tigris, such towns have always stood at points from which roads ascend to convenient passes in the eastern highlands. In such a position, on the left bank of the Tigris, stood in ancient times *Nineveh*, the immense ruins of which were discovered about forty years ago, and opposite the same point afterwards rose **Mosul**, still an important town. Lower down, *Seleucia*, *Ctesiphon*, and **BAGDAD**, all arose on sites within no great distance from each other at the end of another pass-road; and the last of these still survives, although greatly declined as compared with what it was when the Arabs were at the height of their power, and this was the capital of their empire.[1] On the Euphrates there is now no town of importance, that river being too much exposed to the attacks of the plundering tribes of the desert; but in ancient times there stood on its banks the large and magnificent city of *Babylon*, at the point where the river begins to be navigable both up and down stream. In the middle part of their course both Euphrates and Tigris are too impetuous for up-stream navigation, and goods are only floated down on rafts supported by inflated sheep-skins. The wood of the rafts is itself an important commodity in this treeless region. On the Shat-el-Arab stands **Basra** or **Bussora**, accessible to sea-going ships, and formerly the chief seaport of this region, but now outvied by the Persian town of Mohammera, at the head of the delta.

[1] This was the seat of empire of Harun-al-Rashid, the famous contemporary of Charlemagne, so well known from the 'Arabian Nights.'

5. **ARABIA**, the largest peninsula in the world, being upwards of a million square miles in extent, or nearly five times as large as the Iberian Peninsula, which it also exceeds in average elevation (3,500 feet as against about 2,500). One half of the peninsula lies to the south of the tropic of Cancer.

The **mountains** of Arabia are situated along the coasts, and especially along the Red Sea coast in the west and the Gulf of Oman in the south-east. Less elevated are the heights along the south coast facing the Indian Ocean, and along the east facing the Persian Gulf. In the extreme north-west, between the **Gulfs of Suez** and **Akabah**, the northern branches of the Red Sea, the granite **Mount Sinai** rises abruptly[1] to the height of more than 9,000 feet amidst a rocky peninsula.

Nearly the whole of Arabia is scantily supplied with rain, and the coast mountains rob the interior of rain almost entirely.[2] Hence in the north and south the greater part of the interior is an utterly uninhabitable desert. Only in the middle the region known as the **Nejd** or **Negd** is studded with numerous date-crowned oases, the home of the Beduins or nomadic Arabs, who rear with care and affection immense numbers of horses and single-humped camels, both of which are among the finest in the world. Here, too, ostriches and gazelles bear witness to the likeness which this part of Asia presents to Africa (see p. 333).

FIG. 54.—THE SADDLE, OR PAD, ON WHICH A CAMEL'S LOAD IS LAID.

The settled population inhabits the coast-strips, and above all the more mountainous tropical portions, which are the best supplied with rain—**Yemen** and part of **Hejaz** in the west, **Oman** in the south-east. Even in these districts, however, the rains are only periodical, and sometimes fail for years together, and hence water has from the remotest period been stored in reservoirs for irrigation. Among the products of these regions, besides the date and coconut[3] palms, durrah[4] and other grains, are numerous aromatic

[1] See Introd. p. 25.

[2] See Introd. p. 52.

[3] Frequently spelt *cocoa-nut*, but throughout this textbook *coco-nut*, to avoid confusion with the cacao tree from which the so-called cocoa is obtained.

[4] One of the cereals to which the name of millet is given. Like several other so-called millets, it has several ears of grain at the end of each stalk. It is the principal cereal grown by the natives in most parts of Africa and in Southern India.

trees and shrubs, balsam, gum, frankincense, as well as the celebrated coffee which takes its name from the port of **Mocha**, whence it was at one time chiefly exported.

Politically the greater part of the west coast is part of Asiatic Turkey, and so also is the northern half of the strip on the Persian Gulf, but even in these parts the Arabs have an organisation of their own. Small groups of families acknowledge the authority of a sheikh, and the subjects of several sheikhs acknowledge the supremacy of an emir. The most powerful emir is the Imaum of **Maskat** (Muscat), who rules over Oman. The fortress of **Aden**, with its fine natural harbour and a small district round on the south coast near the Straits of Babelmandeb, belongs to Great Britain, which also possesses several small islands on the coast. Sinai and the north-west form part of Egypt.

The most celebrated towns are in the Turkish portion of the peninsula on the west. Here, about the middle, is **Mecca**, the birthplace of Mohammed,[1] the founder of the Mohammedan religion; the sacred city of the ancient Arabs, and now of all Mohammedans. At the pilgrimage, or *Haj*, which takes place in spring, myriads of pilgrims, attended by immense troops of camels, assemble for worship and trade. To the west is **Jedda**, the port of Mecca; to the north **Medina**.

The Arabs, now the most numerous, long the most aggressive of the Semitic races, inhabit the whole peninsula, but their true home is the plateau of Nejd, whence have issued all the continuous streams of Arabs, who, soon after the founding of the Mohammedan religion, spread in conquering armies eastwards to India, and westwards to the Iberian Peninsula, and established in the Middle Ages splendid monarchies both in the East and West, and have since then constantly spread as traders through Eastern and Inner Africa, as well as in Asia as far as the Eastern Archipelago.

6. **IRANIA.**—This is a general name applied to the table-lands between Mesopotamia and the plains of the Indus, and thus embraces an area of about a million square miles wholly outside of the tropics (nowhere below 25° N.). The population, however, is estimated at only about twelve millions, a consequence partly of the nature of the surface and climate, partly of the state of government.

The table-lands have an average elevation about equal to that

[1] Born A.D. 571. The Mohammedans reckon time from the date of the flight of Mohammed from Mecca to Medina on the occasion of a rising against him in the former city. The date of the flight or *Hejra* (Hegira) was July 6, 622, which is hence the beginning of the Mohammedan era.

of Arabia (about 3,500 feet), and are begirt and traversed by mountain ranges, the passes across which are generally high and inconvenient. In the western half the mountains generally trend south-eastwards (in a direction corresponding to that of the Caucasus), while in the east they have an east and west trend on the north and south, a northerly trend on the eastern borders (**Sulaiman Mountains**), and a north-easterly trend on the north-east. There the lofty range of the **Hindu Kush** (higher than the Alps) separates some of the most elevated and secluded valleys in the world; those on the south-east draining to the Indus, those on the north-west, including the **Pamir Plateau**, to the desert region of Inner Asia. In the west the loftiest mountain range is that of the **Elburz**, parallel to the south shore of the Caspian Sea, and at no great distance from it.

Cultivation everywhere demands irrigation, and is thus confined to the borders of the rivers and the bases of the mountains,[1] into the heart of which canals (**karezes**) are often pierced till water-bearing beds are reached. Wheat, rice, cotton, tobacco, and opium are grown. Fruit-trees are abundant (the peach a native of Western Irania). The date-palm[2] flourishes in the south-west and south, but is banished from the interior by the winter cold due to exposure to the north-east winds. Nomads inhabit the districts incapable of cultivation, rearing horses and camels, the two-humped camel now replacing the single-humped camel of Arabia.

The western half of Irania is under the despotic and crushing sway of the Shah of **Persia**, the eastern half divided between **Afghanistan** in the north and **Baluchistan** in the south. Of the former the emir of the Afghans is the nominal ruler throughout, but many of the tribes, and particularly those belonging to the lofty valleys on both sides of the Hindu Kush, are virtually independent. In the thinly inhabited steppes and deserts of Baluchistan there is hardly a pretence of common rule.

The **inhabitants** of Irania are mainly of Aryan race and language, and indeed the table-lands of this region seem to have been the centre from which that now widely extended stock dispersed. The **religion** is almost everywhere Mohammedan; but the Mohammedans of Persia and some of the tribes to the east belong to a sect regarded as heterodox by the rest of the Mohammedan world,

[1] See Introd. p. 52.

[2] See p. 333.

the sect of the **Shiites**, who reject the Sunna or body of traditions supplementary to the Koran, held sacred by the other Mohammedans, who are hence called Sunnites.

In the desert (chiefly round Yezd) are a few adherents of Zoroastrianism.

The capital of Persia is **TEHERAN** (200), at the southern base of the Elburz Mountains. Even more populous is **TABRIZ** (200), in the north-west, on the Armenian plateau, the centre of the northern trade with Europe, a trade which, since the construction of the Transcaucasian railway, has been almost entirely in the hands of the Russians. At the sacred city of **Meshed** (a Shiite Mecca), in the north-east, the products of Europe are passed on to Afghanistan and Central Asia. Among the south-western mountains of Persia is **Ispahan**, the former capital, one of the residences of the caliphs[1] in the glorious days of the Arabs; and still farther south, in the original country of the ancient Persians, not far from the ruins of Persepolis, is the lovely town of **Shiras**, celebrated for its rose-gardens, vineyards, and nightingales.[2] In the part of Persia to which these towns belong the trade is mainly in the hands of the nations of Western Europe (chiefly the English), and enters the country by the ports of **Bushire** and **Mohammera**, the former on the Persian Gulf, the latter at the head of the delta of the Shat-el-Arab.

Afghanistan and its principal towns derive their importance chiefly from the fact that they command the north-western passes leading into India. Of these the most important lie north and south of the Sulaiman Mountains; in the north the **Khaibar Pass**, on the route which mostly follows the Kabul river, commanded by the city of **Kabul**, and the **Kurrum Pass**, a little to the south; in the south the **Bolan** and **Hari Passes**, leading from Kandahar. The only railway as yet existing in any part of Irania is one constructed for defensive purposes by the Government of India across a desert which lies in the route of the latter passes. The chief town of Western Afghanistan is **Herat**, on the issueless **Heri Rud**,[3] which fertilises a long valley running east and west, and forming the natural approach to Kabul. In Baluchistan, **Kelat**.

II. THE MONSOON COUNTRIES AND THEIR DEPENDENCIES.

1. INDIA.—This vast country, which is now entirely under British influence, occupies, if we include all the Himalayan States but exclude British Burma, an area of nearly one and a half million square miles, or more than sixteen times the size of Great Britain. Its population at the last census (1891) was nearly 290 millions, two-fifths of whom were congregated in

[1] See p. 231.

[2] Also celebrated at one time as the centre of Persian culture. Two of the most celebrated of Persian poets, Hafiz and Sâdi, were both natives of this town.

[3] Rud, Persian = river.

the valley of the Ganges in Bengal and the North-West Provinces, which comprise together only one-sixth of the area.

In shape the country is quadrangular, the mainland portion being bounded by two sides which slope north-eastwards and north-westwards to the north of Kashmir, where they meet in about latitude 86° N., and the peninsular portion by two sides which taper to a point in Cape Comorin, in about latitude 8°, N. India thus extends through twenty-eight degrees of latitude, entirely to the south of the most southerly latitude of Europe, and for fifteen and a half degrees within the torrid zone.

By its natural boundaries India is **more completely isolated than Italy**, the corresponding peninsula of Europe. On the north the Himalayas form a complete protection against foreign aggression, and the few lofty passes merely serve as a means of carrying on a scanty trade with the thinly populated regions beyond. On the north-east a succession of mountain ranges and gorges render it equally safe against attack in that quarter, and even prevent the existence of trade with the populous provinces of China, which lie immediately beyond. It is only on the north-western frontier accordingly that India has ever been open to invasion by land-routes, and even there the routes by which invading armies can enter are few and easy of defence. In the southern part of that frontier mountains and deserts render the peninsula almost unapproachable, and consequently the passes by which foreign armies have always found access to the plains of India lie more to the north. The Khaibar Pass is that which has been most frequently chosen.

Surface.—Within the frontier mountains lie **two extensive plains**, following the same general direction as the mountains, and watered by two great rivers with their tributaries, the basins of which form in several respects striking contrasts. The north-western plain is that of the **Indus**, a river which rises on the table-land of Tibet, and bursts through the whole Himalayan system, before it emerges on the arid expanse traversed by the greater part of its course, a river extremely difficult to navigate on account of its shifting shoals, and very destructive on account of the numerous changes of its bed. The north-east plain is that of the **Ganges**, a river which, like most of its tributaries, breaks through only the southern or loftier chain of the Himalayas, and

which becomes a navigable stream as soon as it enters on the plain, this plain being one of the best watered, most fertile, and most densely populated in the world. Ultimately the Ganges unites with the **Brahmaputra** to form a delta as large as Louisiana, on the outer margin of which new land is being formed with almost unparalleled rapidity.

South of the plains extends a table-land varying from 2,000 to upwards of 3,000 feet in height, occupying the greater part of the peninsula proper. Its northern boundary roughly corresponds in direction with the frontier mountains of India, but on the north-west the table-land is broken in upon by a tract of lowlands stretching across the neck of the minor peninsula of Gujerat, and connecting the lower valley of the Narbada with the plains of the Indus. The south-west and south-east boundaries of the plateau are much better defined. The south-west edge of the plateau, seen from the narrow strip of flat coast to which it descends with remarkable abruptness, appears like a mountain range, and is known as the **Western Ghats,**[1] from the passes by which it is ascended. About the southern extremity of the Ghats rises the lofty group of mountains called the **Nilgiri Hills,** which terminate the plateau, for immediately to the south occurs a remarkable depression called the **Palghat Gap** (about twenty-five miles wide and only about 1,000 feet in height), which affords an easy route for the railway from Beypur near Calicut to Madras, and separates the table-land from the **Cardamom Mountains,** which stretch southwards to Cape Comorin.

On the south-east the table-land is bordered by the **Eastern Ghats,** which are lower than the Western, and leave at most places wider tracts of lowland between the elevated interior and the coast. On both sides the **coast** is generally surf-beaten and difficult of access.

The principal **rivers** by which the table-land is traversed are the **Narbada** and **Tápti,** which flow into the Gulf of Cambay in the north-west, and the **Mahánadi, Godávari,** and **Krishna,** which enter the Bay of Bengal. They are all more or less impeded in their navigation by rocky rapids, but the Narbada, Mahánadi, and Godávari are navigable in the lower part of their course.

[1] Ghat is an Indian word for 'a stair,' especially a broad stair leading down to a river such as is common in India; hence 'a mountain-pass.'

A large part of the table-land is covered with a rich black soil as important to Southern India as the black soil of Europe is to Southern Russia. It is said to have produced crops for a thousand years without manure, and is often called cotton soil from its being so well adapted for the growth of cotton.

Extending over so vast an area, and embracing tracts so diverse in elevation, India necessarily has a very varied climate, but everywhere the climate is greatly affected by the monsoons.[1] It is upon these that the rainfall depends, but yet the rains occur in different parts of the country at different times.

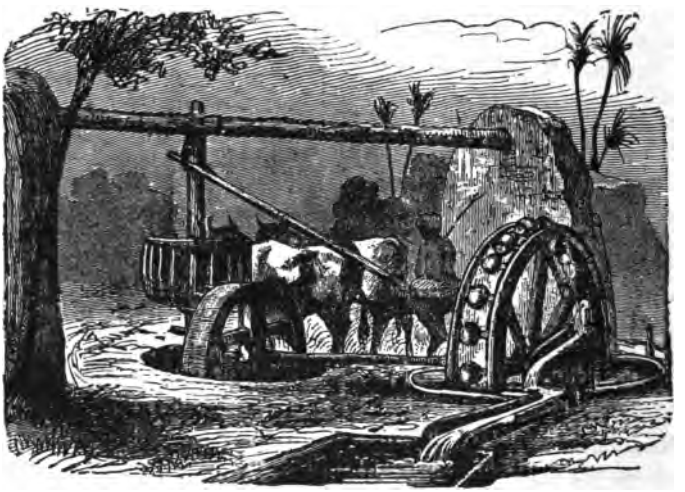


FIG. 55.—A PERSIAN WATER-WHEEL AS USED IN INDIA FOR IRRIGATION. Similar water-wheels are in use throughout the Mediterranean region.

The parts which invariably receive abundant rains from the summer monsoon are the south-western edge of the southern plateau, the hills to the north-east of the Bay of Bengal, and the valley of the Ganges, up which this monsoon is diverted as a south-east wind. Hence in these parts the rainy season is the summer, and above all the third quarter of the year; and in good seasons rain falls during the same period over three-fourths of India. The land monsoon brings rain to different districts at two different periods—to the eastern half of the peninsula as a north-east wind in the first quarter of the year. A small area in the south, where the Palghat Gap affords access to the south-west monsoon, receives rain both from it and from the north-east monsoon.

[1] See Introd. pp. 42, 51.

The variations in the extent and abundance of the rains are the chief cause of the famines from which different portions of India suffer from time to time. Throughout a large part of the country it is uncertain whether the rainfall of the year will be sufficient to produce a crop at all, and hence the necessity for irrigation. About one-tenth of the cultivated area in India is supplied with water by this means; in the north canals being led from the rivers, while in the south there are numerous tanks or reservoirs in which water is stored.

With regard to its chief **agricultural products**, India may be divided into three regions: (1) the colder and drier parts of the north, form the **wheat region** (North-West Provinces and Punjab); (2) the moist warm plains from Bengal to Krishna form the **rice country**; (3) the drier parts of tropical India, including all the black soil area, form the **region of millets**.[1] Wheat, however, extends also into this region, and the finest kind is grown on the black soil of the valley of the Narbada. In general the **growth of wheat in India for export** is becoming every year of more importance, and since the beginning of the present decade India has come next after the United States in the amount of wheat it supplies to England. Besides these food-grains the agriculture of India produces **cotton** (chiefly on the black soil), linseed and other **oil-seeds**, **jute**[2] in Bengal, **opium** and **indigo** in the same province, **tea** at various places along the slopes of the Himalayas (particularly Assam and Darjiling), coffee (in the hill districts of Southern India), sugar-cane, tobacco, numerous spices and other less important products.

Forests are found chiefly on the mountain slopes. A broad strip of forest known as the **Tarai** stretches, however, along the base of the Himalayas, forming with its underwood a dense jungle, the haunt of wild beasts and a source of poisonous exhalations; and a still more deadly jungle occupies the marshy tract called the Sandarbans, at the mouth of the delta of the Ganges. Altogether the forests in the British provinces are estimated to cover one-twelfth of the total area. Most of these are now under the management of the Government.

The **principal timber trees** belonging to them are **teak** and

[1] Both the durrah of Arabia and Africa, here called *joári*, and another cereal called in India *bajra*. [2] A strong vegetable fibre used in making sacking and cloths.

sal, both remarkable for the hardness of their wood, that of the **teak** tree being highly valued as material for ship-building. Among the other trees of India may be mentioned the **mulberry**, on which large numbers of silkworms are reared, particularly in Bengal and the Punjab; the **coco-nut palm**, which fringes and adorns the coasts of the peninsula; and the **date-palm**, which is grown on irrigated land in the valley of the Indus as high as **Peshâwar** and **Amritsar**.

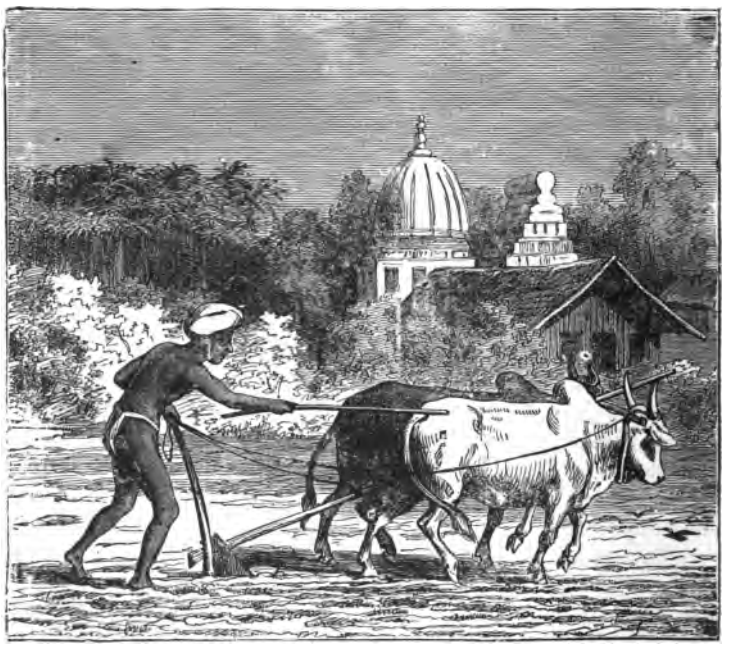


FIG. 56.—PLOUGHING WITH ZEBUS, OR HUMPED OXEN, A BREED VERY ABUNDANT IN INDIA.

Among the more noteworthy **animals** of India are the tiger and other beasts of prey, the elephant, and numerous serpents and monkeys. Under British rule a great deal has been done towards extirpating beasts of prey and venomous serpents, but even yet thousands of people in India are killed every year by wild animals, chiefly snakes. Monkeys often commit great ravages

in the cultivated fields, and some of these are preserved from destruction through being held sacred. Elephants are of great value as beasts of burden.

The **mineral wealth** of India is far from abundant. There are many **coal-fields**, but the coal is generally of poor quality, and the only district in which many mines have been opened is round Raniganj, 120 miles north-west of Calcutta, where coal was worked more than a hundred years ago.

The **roads** of the country till the middle of the present century were little better than mere tracks, fit only for rude ox-wagons, and human carriers and pack-bullocks were the principal agents of commerce except where there are navigable rivers. So favoured, however, is Bengal in the possession of this means of communication that in some parts of the province almost every cottage has a navigable stream at its door, and the Bengalese farmer keeps his boat as regularly as the English farmer his gig. All the principal towns in India are now, however, connected by roads, and in addition 12,000 miles of railway have been constructed.

With the increase in the means of internal communication the foreign **commerce** of the country has advanced with enormous strides under British rule. Since 1840 the value of the imports has increased ninefold and that of the exports sevenfold, and now the value per head is much greater than that of any other Asiatic country. The **chief articles of export** are **raw cotton, grain** (particularly wheat and rice), **opium**, indigo, jute, and tea; while among the **imports** by far the most important item is **cotton-goods**. The external commerce is chiefly with the United Kingdom, the cotton fabrics of which have now almost entirely superseded the hand-woven goods of the natives, and with these have nearly extinguished the production of the delicate muslin fabrics for which some parts of India have long been noted (**Dacca muslin**).

Native manufactures now survive chiefly in the **Punjab**, but cotton factories on a European model have been introduced in the territory under the Governor of Bombay, and jute factories in Bengal.

The **people** of India may be roughly divided into two great sections, those of the northern plains, and those of the hills and the peninsula. The former are mainly an **Aryan race**, speaking a variety of languages allied to the **Sanskrit**, and cannot be re-

garded as the oldest inhabitants of the country. They immigrated by the north-western passes many centuries before the beginning of the Christian era, and seem to have driven the earlier inhabitants to the hills. The latter are now chiefly represented by the **Dravida peoples** of the peninsula proper, a race darker in colour and not as well formed as that of the plains, and speaking languages wholly distinct (**Tamil** and **Telugu**).

As regards **religion**, about three-fourths of the people are adherents of **Hinduism**. Next to Hinduism, **Mohammedanism** is the religion most largely professed, its adherents numbering about one-fifth of the entire population. The number of Christians does not yet reach two millions.

The Mohammedanism of India is a result of several successive conquests by Mohammedan powers both in the north and south. The last of these conquests which left important permanent results was that of Baber, who invaded India in 1525 and founded the Mogul Empire, which continued to exist at least in name till 1857. Shortly before the invasion of Baber, the Portuguese had acquired a footing in the peninsula, and for about a hundred years this people retained in their own hands almost all the trade of the East. They were followed by Dutch, English, Danes, and French, but about the middle of last century the English influence (represented by the East India Company), through victories over the French and natives, became paramount, and now England rules directly over considerably more than half of the entire country.

Since 1858 the **government** of British India has been vested in the Crown, which appoints a viceroy or governor-general for the whole country, and a council of fifteen members who assist in legislation. The revenue is mainly derived from a **land-tax**, the sale of opium (which is a Government monopoly and an important export to China), and a **tax** on salt.

The principal **native states** are Haidarabad, Mysore, Baroda, and the states of the Rajputána and Central India Agencies.

There are in addition three native states in the Himalayas, Kashmir, Nepal, and Bhutan, which are entirely independent, except that in Kashmir the ruler is bound to consult the British authorities in case of disputes.

The provinces of British India are placed under the administration of officials bearing various titles. The native states are subject to their own rulers, who are, however, bound to allegiance

to the British authorities, and have a British official stationed at their court.

The provinces are the following :—

	Area in thousands of square miles[1]	Population in thousands (1891)	Density per square mile
Under the Governor-General:			
Ajmir and Mhairwára	2·7	541	200
Berar	17·7	2,896	164
Coorg	1·5	172	109
Andaman and Nicobar Islands[2]	·8	15	—
Under Governors:			
Presidency[3] of Madras	140·0	35,591	253
Presidency of Bombay (including Sind and Aden)	125·3	18,907	151
Under Lieutenant-Governors:			
Bengal	150	70,909	474
North-West Provinces and Oudh	106	46,930	442
Punjab	111	20,807	178
Under Chief Commissioners:			
Assam	46	5,424	117
Burma, Upper and Lower	156	7,554	48
Central Provinces	86	10,775	125

The total population of British India, including Burma, is about 220,000,000, of the native states about 66,000,000. The average density of the population throughout the country is under 200 to the square mile, but many parts are greatly over-peopled, and are inhabited by swarms of human beings living in a state of the most abject poverty. Nevertheless the people of India, unlike the Chinese, exhibit great unwillingness to emigrate. A small number leave the country every year to work as coolies on sugar and other plantations in tropical colonies, or colonies near the tropics. About half a million Indian coolies are now estimated to be living in various colonies, chiefly British.

Provinces and Towns.—1. Bengal, the province of the Lower Ganges, but including also the delta of the Mahanadi (Orissa).

CALCUTTA (450 ; 840), the seat of the supreme government, on the Húgli, a branch of the Ganges, liable like all the others to be choked by silt, which has led to the decay of several predecessors of Calcutta ; but the Húgli is now kept open by engineering works for ships of the

[1] For the sake of comparison it may be mentioned that New York has in round numbers an area of 50,000 square miles, Rhode Island 1,250 square miles.

[2] These two groups of islands in the Bay of Bengal have each a convict station on one of their islands, and the population here given is chiefly composed of convicts, and does not include aborigines.

[3] India was formerly divided under three governors called presidents, but the former presidency of Bengal has now been divided up among various officials.

largest tonnage. The North or Black Town is occupied by natives, the South by Europeans. **PATNA**, higher up on the main stream of the Ganges, centre of the opium trade, and the scene of great Mohammedan festivals. **Gaya**, farther south, memorable as the birthplace of Gautama or Buddha, founder of the Buddhist religion.

2. North-West Provinces, including Oudh, the latter one of the most fertile districts in the world, with a dense but now stationary population. **LUCKNOW** (273), formerly the capital of the kingdom of Oudh, between the Ganges and its tributary, the Goghra. On the Ganges itself **BENARES** (222), the sacred city of the Hindus, and seat of a Sanskrit college. **ALLAHABAD**, at the junction of the Ganges and the Jumna, and now at that of the railways to Calcutta and Bombay, hence a great and rapidly rising centre of trade; also seat of a university, founded by the British. **CAWNPORE**, memorable as the scene of a massacre of the English by revolted sepoys in 1857. On the Jumna, **AGRA**, once the

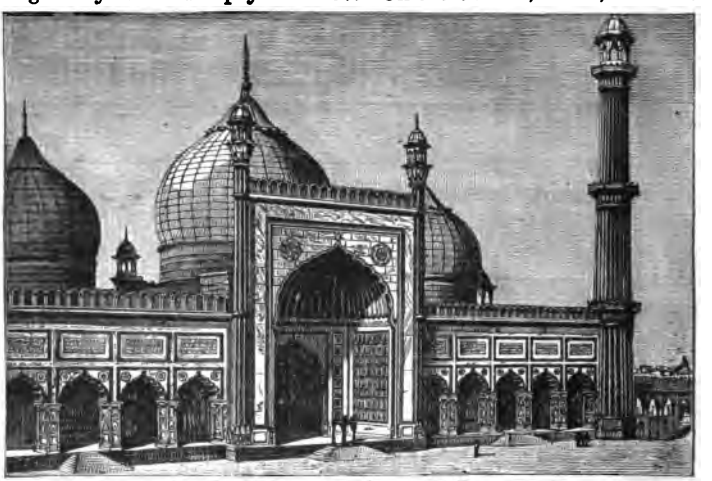


FIG. 57.—THE JAMA MASJID, THE PRINCIPAL MOSQUE AT DELHI.

residence of the Great Mogul,[1] celebrated for its great mausoleum, called the Taj Mahal. South of Agra, in the native state known as Sindhia's Dominion, is the town of **Gwalior**, with a magnificent fortress which was kept in the hands of the British from 1858 to 1885.

3. Punjab, 'the land of the five rivers,' so called from the five rivers which here unite to contribute their waters to the Indus, a land divided by these streams into **duabs**, or districts lying between two rivers. Among the inhabitants are numerous **Sikhs**, a fanatical and warlike religious sect. On the Jumna, **DELHI**, also one of the former seats of the Great Mogul, situated at the edge of the more or less desert country intervening between the Jumna and the passes of the north-west. In the richest of the duabs, between the Ravi and the Bias, is **Lahore**, from the earliest period a meeting-place of trade routes, and

[1] The name given to the ruler of the Mogul Empire.

now a great railway centre. To the east, **AMRITSAR**, with manufactures of Cashmere shawls, &c. In the extreme north-west, **Peshâwar**, important as a defensive station from the fact of its lying opposite the mouth of the Khaibar Pass. In the north-east, among the Himalayas, **Simla**, at the height of upwards of 7,000 feet above sea-level, an important sanitary hill-station, and residence of the Government of India during the hot season.

4. **Rajputâna**, the collective name for a number of native states, chiefly occupying desert plains in the lower valley of the Indus, but containing two large and fine towns, **JAIPUR** and **Jodpur**, in fertile tracts watered by streams descending from the Aravalli Hills.

5. **Bombay and Sind.**—**Karâchi**,[1] in Sind, at the extremity of the north-west coast of India, a seaport rapidly rising in importance on account of its export of Punjab wheat. Between Sind and the rest of the Bombay presidency lies the district of **Cutch**, with the **Run of Cutch** (a sandy waste, encrusted here and there with salt, and flooded during the wet season), and the peninsula of **Gujerat**, at the root of which is situated the important town of **AHMEDABAD**. **SURAT**, at the mouth of the Tapti, has a considerable trade in cotton. **BOMBAY** (804), capital of the presidency, on a small island connected by an artificial causeway with the mainland, has the largest and safest harbour in India, and is the rival of Calcutta as a seaport (acquired by the English from the Portuguese in 1661). On the neighbouring islands of Salsette and Elefante are fine remains of cave-temples. Among the inhabitants of Bombay are 50,000 Parsis (see p. 291), who occupy a very influential position in trade. On the table-land behind Bombay, on the railway to Madras, **POONA**.

6. **Central Provinces and Berar**, occupying the north of the table-land; comparatively thinly populated, except in the valley of the Narbada. **NAGPUR**, the most important town in the Central Provinces, once one of the chief towns of the Mahratta kingdom, which, in the seventeenth and eighteenth centuries, embraced a large part of the table-land of Southern India.

7. **Haidarabad**, or the Dominion of the Nizam, the most extensive native state in the table-land, with a fertile soil producing cotton, wheat, and oil-seeds. **HAIDARABAD** (312) near the centre of the dominion is the capital, and six miles to the west is **Golconda**, with the famous tombs of the kings—namely, those who reigned over this territory in the sixteenth and seventeenth centuries; once noted also for its diamond beds (now exhausted).

8. **Mysore**, a large native state farther south, producing grain, sugar, and coffee. Chief towns, **Mysore** and **BANGALORE**.

9. **Madras Presidency.**—On the west or Malabar coast, **Calicut**, at one time the most important place on the entire west coast of the peninsula. On the east or Coromandel coast, **MADRAS** (450), the third largest town in India, and the third seaport in rank, notwithstanding the fact that it is situated on a surf-beaten shore, difficult of access. It is now provided with an artificial harbour formed by two long piers built out to sea.

To this presidency belong the **Laccadive** (coral[2]) Islands, off the west coast.

[1] Often spelled *Kurrachee*. [2] See Introd. p. 83 n.

10. **British Burma.** See Indo-China.

11. **Kashmir** is a mountainous state in the extreme north-west, having in the centre a small high-lying valley, with a fine equable climate, producing corn, wine, and silk, besides roses and other flowers innumerable. The chief town in this valley is **Srinagar**, on the Jhelum, a tributary of the Indus.

NEPAL, the native country of the warlike Gurkas, has for its capital **Katmandu**, important as the key of the chief passes across the Himalayas.

BHUTAN, further east, now confined to the most mountainous parts of its former area, the duars, or hill country, further south, having been ceded to Britain, in return for which a small subsidy is paid to the ruler of the state.

2. **CEYLON**, an island more than half the size of Cuba, lying to the south-east of India, from which it is separated by a strait so shallow as to have only two or three channels navigable for small vessels. It consists of a belt of low country surrounding a core of mountains. The island is a British crown colony.

Coffee was long without a rival among its products for export, but of late has been giving place to **tea**, and since 1884 Ceylon has been the chief source of the **Peruvian bark** (p. 176) imported into Britain. **Pearls** are obtained in the Gulf of Manaar. The native inhabitants are mainly a gentle race of Buddhists; but Hindu immigrants, speaking Tamil, are numerous in the north. The **Maldive** (coral) **Islands**, lying to the south-west, are tributary. Capital of the colony, **Colombo**, on the west coast.

3. **INDO-CHINA** is the name generally given to the peninsula between India and China.[1] It lies almost entirely within the torrid zone. Its area is about 800,000 square miles, and its population, estimated at about 36,000,000, has a density of only about forty-five to the square mile, much smaller accordingly than either of the other great monsoon countries in the east and west—a consequence of the highly mountainous surface, and the density of the tropical forests.

The **mountains** generally trend north and south parallel to the chief rivers, which they confine in many places to narrow gorges, receding at other parts to form wide and fertile valleys. The chief seats of population are the vast **rice-fields** of the river deltas, all of which are liable to be flooded during the summer rains, on which account the houses are frequently built on stakes to raise them above the flood-level, sometimes on rafts moored on the rivers themselves.

[1] **Also known as the *Eastern Peninsula* and *Further India*.**

The **principal rivers** are (1 and 2), in the west the **Irawadi** and the **Salwin**, the former with **RANGOON** on its wide delta, the latter with **Maulmain**[1] at its mouth; (3) the **Menam**, with **BANGKOK** (500) at its mouth, flowing into the Gulf of Siam; (4) the **Mekong**, flowing into the Chinese Sea, and forming a large delta, on which stands the town of **Saigon**; and (5) the **Song-koi**,[2] or Red River, flowing south-eastwards into the Gulf of Tongking, with **Hanoi** or Kesho near the head of its delta. **Numerous rapids impede the navigation** of the rivers, and only the Irawadi is capable of being ascended by steamers for any great distance. On that river British steamers ascend to **Bhamo**, close to the Chinese frontier.

The **inhabitants** of the peninsula are mainly of Mongolic race, and speak languages allied to the Chinese. In religion they are **Buddhists**, and Buddhist pagodas are among the most conspicuous ornaments of the towns. On the **Malay Peninsula**, which stretches like a finger southwards almost to the equator, the inhabitants are Mohammedan Malays, but on all the coasts, and especially in the east and south, Chinese immigrants and settlers form the hardest-working section of the population.

Politically the peninsula is divided among various powers. **A** strip on the north-west, extending from Bengal to the root of the Malay Peninsula, formerly called British Burma, now **Lower Burma**, is under the government of India. It has an area about twice that of New York, and is divided into the provinces of **Aracan**, **Pegu**, **Irawadi**, and **Tenasserim**. It is specially valuable for its **rice** and **teak**.

The population of these provinces, being small relatively to their resources, has been growing under British rule with extraordinary rapidity. Between the censuses of 1871 and 1891 it increased by sixty-seven per cent., the density from thirty-two to fifty-two to the square mile. Lower Burma is the only part of Indo-China in which railways have yet been introduced, two starting from Rangoon, one for Prome, on the Irawadi, the other proceeding northwards by Pegu. Proposals are now being made for the construction of a railway from the Gulf of Siam to the Chinese frontier, with the view of extending commerce with the rich provinces of south-western China.

On January 1, 1886, the former kingdom of Burma, with **MANDALAY**, on the Irawadi, for its capital, was added to the British dominions, and is now known as **Upper Burma**, so that Britain has now the command of the whole course of the Irawadi as far as Bhamo.

On the east side of the straits of Malacca a considerable portion of the **Malay Peninsula** is in British possession or under British protec-

[1] Also spelled *Moulmein*. [2] Also called the *Song-ha*.

tion (chief town **Malacca**): and on a small island at the extremity of the peninsula is the British seaport of **SINGAPORE**, lying in the route from India to Australia, as well as Eastern Asia, and hence the most important seat of marine commerce in Indo-China, although in the early part of the present century it contained only a handful of people.[1] The inhabitants are chiefly Chinese.

The lower and middle parts of the basin of the Menam, and the middle part of the basin of the Mekong, form together the **Kingdom of Siam.** The lower part of the basin of the Mekong above the delta is the former kingdom of **Cambodia,** which, after existing for some time as a feeble state under French protection, has now been taken under direct French rule. At one time it was the seat of a highly developed civilisation, of which there are some magnificent remains, the most remarkable being the temple known as Angkor Wat. The delta itself,

FIG. 58.—VIEW OF BANGKOK, SHOWING FLOATING HOUSES, AND IN THE DISTANCE A BUDDHIST PAGODA. (By the kind permission of Mr. Murray.)

forming **French Cochin China,** is under French rule, and France also possesses the delta of the Song-koi (**Tongking**), and claims a protectorate over the **Empire of Anam,** in the east of Indo-China (capital **Hue,** on the coast). In the interior are numerous independent tribes, the chief of which are those of the **Shan States.**

4. THE EASTERN OR MALAY ARCHIPELAGO.—This large assemblage of islands in the south-east of Asia extends over an area nearly as great as that of Europe, although the land surface is only about one-fifth of the area of that continent. It consists of islands both large and small, Borneo, the largest, being more than six times, and Sumatra, next in size, nearly four times as

[1] The island was bought by the British in 1819, on the suggestion of Sir Stamford Raffles, who perceived the peculiar advantages of its situation for Eastern commerce,

large as Cuba. A line of active volcanoes (about fifty in all) passes round the outside of the group, just touching Celebes, in the north-east.

The whole group lies within the tropics, and all, except the Philippines, between 10° north and 10° south. Favoured by the monsoon rains, the **vegetation** is almost everywhere as luxuriant as the tropics can show. Dense forests cover the slopes of the mountains, which occupy the greater part of the surface. Cocoanuts, bananas, and the pith of the **sago palm** supply food with too much ease to demand much energy on the part of the people. From the sago palm ten days' labour suffices to obtain food that will last a man for an entire year. Other wants are supplied with equal ease. Of clothing little is needed, and for house-building, bridge-building, and all kinds of domestic utensils the **bamboo** furnishes abundance of material, which can be worked with the greatest facility. Hence the native population seldom exhibits any energy except under foreign influence.

Most of the original **inhabitants** are Malays, a brown-complexioned race, with smooth straight hair, rather silent in disposition and subdued in manners, expert in fishing and in the management of small slim boats, with which they make long voyages from island to island. At one time Buddhists, they attained in Java, under Buddhist influences, a high degree of civilisation, of which there are relics in the form of a Malay literature and splendid buildings,[1] rivalling those of Cambodia. Afterwards the Arabs gained them over to Mohammedanism, and that religion is still professed on most of the islands, on some of which the Arabs, though few in number, hold a very influential position. After the discovery of the sea-way to India at the close of the fifteenth century, the Arabs were followed by Portuguese and Dutch, the latter of whom now claim possession of most of the archipelago, except the Philippine Islands, which, together with the adjacent small islands of the Sulu Archipelago, belong to Spain. Chinese traders and miners are pretty numerous.

The **Dutch possessions** consist of the **Great Sunda Islands**, in the west, the **Lesser Sunda Islands**, forming a string stretching eastwards from Java, and the **Moluccas**, between Celebes and New Guinea.

Among the Great Sunda Islands **Java** is that in which Dutch influ-

[1] The most remarkable is the temple of Boro Buddor, near the middle of the island.

ence has been most exerted, and this island is consequently the most productive and most densely peopled of all large tropical islands.[1] Fields of **rice** and **sugar cane** occupy the lower levels along with

FIG. 59.—THE TEMPLE OF ANGKOR WAT, CAMBODIA.

[1] See Introd. p. 59.

tobacco, higher up follows **coffee**, and then tea and cinchona.[1] Some of these products are grown in plantations belonging to the government, others on native plantations, the owners of which are bound to sell their crops to the Dutch Government at a low fixed price, so that the revenue gained from Java has heretofore made up all the deficiencies in the other Dutch islands. Under this system the population has grown from 6,000,000 in 1825 to upwards of 20,000,000, and the density now exceeds that of England. The principal towns are on the north coast—**BATAVIA** in the west, **SURABAYA**[2] in the east.

On **Sumatra** the natives are to a large extent independent, living in fortified villages called kampongs. The smaller island of **Banca**, adjoining on the east, is rich in tin. Of **Borneo** only the south-east is claimed by the Dutch, and even this part is chiefly left to the natives. Off the north-west coast is the small island of **Labuan**, belonging to Britain. It produces **coal**. The territory of the **British North Borneo Company**, in the north of the island, the native state of **Brunei**, adjoining it on the south-west, and **Saráwak**, a state subject to a rajah of British family, are now all under British protection. The very irregular island of **Celebes** has **coffee** and other plantations, under Dutch supervision, in the north-eastern peninsula (Menado), but in most parts the natives are not interfered with. The coffee is said to excel that of Java.

Of the **Lesser Sunda Islands** the largest is Timor, the eastern half forming the last relic of Portuguese rule in the archipelago.

The **Moluccas**, also called the **Spice Islands**, from the nature of their principal products, grow cloves, nutmegs, cinnamon, and other spices, and are very carefully managed by the Dutch.

Spanish rule in the **Philippines** has resulted in the nominal conversion of the inhabitants to Christianity, but has done little for industry and commerce.

Only one island, **Luzon**, has a tolerably dense population (more than 100 to the square mile). Here the chief products are **tobacco**, **sugar**, and a strong fibre known as **manilla hemp**. **MANILLA** (200), on a fine bay on the west coast, is the chief town, and is the largest in the whole archipelago. It has frequently suffered from earthquakes and typhoons.[3]

5. CHINA occupies the east of Asia, from the latitude of Southern France to five degrees beyond the tropic of Cancer (in the island of Hainan). Shut off from the rest of Asia on the north and west by scarcely habitable table-lands, and in the south-west from the fertile plains of India by the mountain barriers of Indo-China, it is by nature one of the most isolated countries in the world, and, being at the same time blessed with a soil of extraordinary fertility and a genial climate, it supports a dense population, which has for the most part remained

[1] See p. 176 n. 1.

[2] Spelled in accordance with the Rules, p. 9. The Dutch spelling is *Soerabaja*, which has the same sound.

[3] See Introd. p. 41.

separate from the rest of the world, and developed at an early period a high civilisation, with manners and ideas quite peculiar.

FIG. 60.—SCENE IN A TROPICAL FOREST (Caroline Islands).

Its total area, even including the parts of Central Asia and Manchuria, now under direct Chinese government, is less than half that of Europe, but the population, according to the most likely estimate that can be formed, is equal to, if it does not exceed, that of Europe.

The country is, for the most part, elevated, and even mountainous, though there are plains and lowlands of great extent.

The great plain, or lowland region, is that which extends in the east from Peking to the Yang-tse-kiang, interrupted only by the mountainous peninsula of Shan-tung. Of the mountains by far the most important, as a physical feature, are the **Fu-niu-shan Mountains**, forming the eastern continuation of the Kuen-lun, and running from west to east, about the parallel of 34° N., more than half across the country: this range separates two regions in the north and south, presenting a marked contrast to one another.

1. As regards **physical features** in the north the valleys and hollows between the mountains are filled with a yellow [1] earthy deposit of great fertility, known as **loess**, which rounds off the outlines of the surface like snow-fields in high mountains, though the loess itself, sometimes thousands of feet in depth, is apt to weather away in such a manner as to form terraced perpendicular precipices.[2] To the south this loess is generally absent, and the mountains, frequently separated by chasmy hollows, stand out in all their grandeur. In the north again the **rivers** are not easily navigable, partly from their impetuosity, and partly from their being filled with shifting shoals derived from the soft loess. The great river of the north is the rapid **Hoang-ho**, or Yellow River, which now flows in the end north-eastwards into the Gulf of Pechili, on the north side of the mountainous peninsula of **Shan-tung**, but about thirty years ago continued its eastern course to the Yellow Sea, south of that peninsula.[3] To the south is the **Yang-tse-kiang**, one of the finest navigable rivers in the world [4] (hence having on its banks many of the largest towns in China), while its tributaries on the right bank form in many cases admirable means of communication between it and the extreme south.

[1] Hence the names Hoang-ho=Yellow River, Hoang-hai=Yellow Sea, due to the colouring derived from this deposit.

[2] See cut, p. 324. This mode of weathering is probably due to the presence in the loess of innumerable minute perpendicular channels lined with calcareous deposits. In northern China millions of human beings live in caves hollowed out in the sides of these precipices. The loess is believed to have been blown into the hollows which it fills from the highlands of Central Asia. See p. 25.

[3] Within a short time the eastern course was again taken by the stream, and then again abandoned for the one to the Gulf.

[4] The continuous navigability of the Yang-tse-kiang for steamers extends as high as Ichang, in about lon. 111½° E., but is there stopped by dangerous rapids.

2. As regards **communication**, in the north are numerous roads, and horses, mules, asses, and the two-humped camel are abundant as beasts of burden, while in the south human carriers are mostly employed where boats and ships are not available.

3. As regards **products**, the north is the land of **wheat, millet, cotton**, and **pod-fruits**, the south of **rice, tea, silk, sugar**,[1] and **opium** (the last chiefly in the south-west); and while in the north

FIG. 61.—VIEW AMONG THE LŒSS TERRACES OF NORTHERN CHINA.
(By the kind permission of Mr. Dietrich Reimer.)

agriculture may be pursued on the fertile lœss as high as 8,000 feet above sea-level, in the south it is mostly confined to the plains and valleys, and to artificial terraces [2] cut out on the lower slopes of the mountains. Only in the western parts of the south, the province of **Se-chwan**, where a fertile red soil takes the place of

[1] The best Chinese sugar is grown on the island of Formosa.
[2] See Introd. p. 37 (3) and comp. p. 329.

the yellow loess, is agriculture pursued to a great height up the mountain sides.

4. As regards **climate**, there is in the north only an alternation between a warm, cloudy, and rainy summer, and a long winter with clear skies and icy north winds; while in the south, on the other hand, there is a more gradual succession of the seasons.

People.—The original seats of the Chinese are unknown, but it is certain that this people immigrated from the north, and it was in the northern part of China that the emperor, an absolute monarch, acquired the title of 'Hoang-ti,' meaning 'Lord of the Yellow' (earth). The Chinese are the chief representatives of the Mongolian type of the human race, but though they make up the great bulk of the population in China itself, and, being by far the most industrious and energetic race in Asia, are rapidly overflowing into all the neighbouring countries and islands in the south-east, and are even spreading beyond the limits of the continent, they have for the last 250 years been subject to a Manchu dynasty, which invaded China from the north-east.[1] In **religion** they are **nominally Buddhists**, but all religions that have taken a strong hold on the Chinese have been reduced by them to little more than ceremonial observances, and the worship to which the people most stedfastly cling is the worship of their forefathers, tablets in honour of whom are preserved in every Chinese household. The system of Confucius, an ancient Chinese sage whose descendants are still held in great reverence by the Chinese, can scarcely be called a religion at all, consisting as it does merely of a code of duties. It is the system adhered to by the learned classes, and all the higher officials are obliged at stated times to perform certain rites connected with it.

Education is prevented from being general by the vast number of characters used in writing in Chinese, but there are nevertheless few countries in which more direct encouragement is given to learning. All government offices are the reward of success in examinations.

The Chinese in their own country have maintained their isolation in a large measure down to the present day. From a remote period there has been a trade with the West by land, chiefly in silk. Intercourse with Europe by sea began in the

[1] It was from their Manchu conquerors that the Chinese adopted the practice of wearing their hair in a 'pig-tail,' that is, in a single long plait hanging down behind.

early part of the sixteenth century, but was confined to Canton till within the last half century, since when several ports have been opened by treaty (hence treaty ports) to European and American commerce. The **chief articles of export** are now **silk** and **tea**, and the **chief import, opium**, from India; next to which come various **manufactured goods.**

Even yet, however, the whole foreign trade of China is only about one-fortieth of that of Europe; and the long-continued aversion of the Chinese Government to the construction of railways was an obstacle to its development. The construction of a network of railways has often been proposed, and would have all the more importance, since China is known to possess enormous **coalfields**—coalfields the united extent of which is estimated to be twenty times as great as that of the coalfields of Europe. The **gold, copper**, and other minerals of the province of **Yün-nan** in the extreme south-west are among the products which it is hoped to make accessible to European commerce by railways. Telegraphs are already extending in China with remarkable rapidity; and the attitude of the Government towards railways has at last been changed.

The large **towns** of China have been known by repute in Europe since the time of the Venetian traveller Marco Polo (end of the thirteenth century), but his accounts were then ridiculed as exaggerated. Even according to the best estimates of the present day, however, China can boast of several towns containing more than a million inhabitants.

PEKING, the seat of government, stands in a densely populated plain in the north-east (prov. Pechili), but in one of the dreariest parts of it. Its population is variously estimated at from 500,000 to upwards of a million.[1] Its port is **TIENTSIN** (1000), on the Pei-ho, a treaty port accessible to Chinese junks,[2] but much more important as the northern terminus of the Grand Canal, a canal 700 miles in length, which forms the great channel of communication between north and south,[3] as far as **HANGCHAU**,[4] at the head of the inlet or gulf of the same name. Of the towns on the Yang-tse-kiang the largest is **HANKAU**[4] (700), at which place, though lying in the centre of the country, sea-going ships can be freighted with tea from the rich tea-growing districts all round. Lower down lies **NANKING**[5] (500), a former capital of China, and still a great seat of Chinese learning. On the Wusung, a little above the mouth of the estuary of the Yang-tse-kiang, stands **SHANGHAI** (350),

[1] All the estimates of population of Chinese towns are very uncertain.

[2] The name of a kind of flat-bottomed ship, high in the prow and stern, used in China and Japan.

[3] The Grand Canal is no longer navigable throughout, on which account one of the Chinese railway schemes most actively promoted at present is that for a railway from Nanking to Tientsin and Peking.

[4] Also spelled *—ow.* See Rules, p. 9.

[5] Meaning 'Southern Court,' as distinguished from Peking, 'Northern Court.'

the most important of the treaty ports, the principal centre of foreign commerce on the mainland of China. The chief town of the south, and indeed the most populous apparently of all China, is **CANTON** (properly Quang-tung, which is the name also of the province in which it lies; pop. 1600), on the delta of the Si-kiang (a branch of which is known as Canton River). It lies in the middle of a region rich in rice, sugar, and indigo, and possessing admirable water communication with the silk and tea districts further north. Close by, on the river, a population of 300,000 dwells in boats moored in long rows.

At the mouth of the estuary of the Canton River are two small islands, in European hands: at the northern entrance the rocky island of **Hongkong**, with the town of **VICTORIA**, belonging to the British; at the southern, **Macao**, belonging to the Portuguese. Of these the former is by far the more important, being the principal seaport of Southern China.

FIG. 62.—CHINESE GATEWAY. (By the kind permission of Messrs. Chapman and Hall.)

Manchuria, in the north-east of China, separated before the accession of the Manchurian dynasty by a long palisade, is a fruitful country, rich in pastures, hitherto thinly populated, but now receiving large numbers of Chinese colonists in the south. **MUKDEN**, on a tributary of the Liau-ho, is the capital, and **Niuchwang** (Newchwang), on the coast, is a rising treaty port.

6. KOREA, the mountainous peninsula to the east of the Yellow Sea, is only now beginning to open itself up to foreign intercourse.

In 1883 a treaty port was opened on the west coast, near the capital **Seul**. Ginseng, a drug highly prized by the Chinese, is exported as a monopoly of the king. Three small islands about 30 miles from the south coast enclose a fine natural harbour known as **Port Hamilton**.

7. CENTRAL ASIA.—The vast mountain-girt tablelands to the north and west of India and China (covering an area of about two-and-a-half millions of square miles in all) are mostly uninhabited solitudes, in some parts of which explorers may travel for three months together without seeing a human being.

Tibet.—The southern part of the area is the loftiest tableland in the world, in the south and west nowhere less than 12,000 feet in height, though sinking in the north, at the base of the Kuen-lun Mountains, to about 4,000 feet in some parts. On this great tableland lie the head-waters of all the great rivers of South-eastern Asia. The inhabitants, who profess an exceedingly corrupt form of Buddhism, and suffer under an oppressive priesthood, are chiefly settled along the narrow basin of the Sanpu (Upper Brahmaputra). Here stands **Lhassa**, the residence of the Dalai Lama, or high-priest, who is worshipped as a god.

North of Tibet and China lies a long relatively depressed area, mostly desert, called by the Chinese the **Han-hai**, or Dry Sea, a name so far appropriate that the region is known to have actually been a sea in some previous period of the history of the world. This area, stretching from the abrupt eastern slopes of the Pamir plateau, in the west, to the so-called **Khingan Mountains**[1] in the east, is as long as the Mediterranean, and, like it, is divided into two portions by a narrowing in the middle. This narrowing is important for two reasons: first, because it reduces the journey across the desert to fourteen days; and secondly, because at this part are situated the only two openings by which great bodies of people can emerge from the Han-hai, either northwards along the northern base of the **Tian-shan Mountains**, or southwards into China along the **Nan-shan Mountains**. Through these gates[2] great hordes of mounted barbarians have swept north and south at different periods, and hence they are now included in a province directly under Chinese rule. It was to prevent such inroads that the Chinese in the third century erected the **Great Wall**—a stone-faced earthen rampart, more than 1,200 miles in length, extending from Peking to Suchau, on the northern slopes of the Nan-shan Mountains; but the wall (now in many places in a state of decay) did not always prove effectual.

In both halves of the Han-hai a caravan trade with China is carried on. The western half, or **Tarim basin**, forming **Eastern Turkestan**, is inhabited by Mohammedan Tatars, who during the short but hot summers, grow wheat, maize, and even rice and wine along the banks of the numerous short rivers which dry up in the sands soon after quitting the base of the mountains. The chief towns are **Kashgar** and **YARKAND**,[3] the former the starting point of the caravans across the Pamir to the valley of the Sir, the latter to the valley of the Amu.

[1] In reality merely the eastern edge of a loss plateau.

[2] Compare the 'Moravian Gate' (p. 239).

[3] Both situated on the routes of the old overland silk trade between China and the West.

The eastern half of the Han-hai is the **Shamo**[1] or **Gobi**, which, along with the mountain-traversed area stretching westwards to Siberia, makes up Mongolia, a region inhabited by nomadic Mongols, Buddhists in religion. **Maimachin**[2] is the town of greatest importance.

All Central Asia is either directly or indirectly subject to China.

8. **JAPAN** consists of a group of large islands opposite the Sea of Japan, together with a string of smaller ones in the north opposite the Sea of Okhotsk (the **Kurile Islands**), and another in the south opposite the Yellow Sea (**Lu Chu Islands**[3]). Their area is less than three times that of New York State, but their population (above forty millions) more than five-eighths that of the United States. **Hondo, Sikoku,** and **Kiusiu,** the most populous islands in the group, lie in the same latitude as the eastern or more southerly half of the Mediterranean (including the Ægean Sea).

In some respects Japan may be regarded as an Asiatic Britain. The islands are well situated for commerce, their shores deeply indented, and provided with numerous harbours, especially in the east and south; and the difference in temperature is less than might be expected from the latitude.[4] At Tokiyo, the capital, which is in the latitude of Malta, the hottest month is about 15° warmer than at London, but the coldest a few degrees colder. Yezo, the northernmost island, though in the latitude of Southern France, has a severe climate, and is inhabited only by from 100,000 to 150,000 people round the coasts.

The entire group is mountainous, so that even on the populous islands the level cultivated ground, including the terraces on the hill slopes,[5] forms less than one-eighth of the entire area. The few plains of any importance lie along the lower courses of the rivers. The principal mountain peaks are conical volcanoes, active or extinct, which rise to a great height above the general elevation of the mountain ranges, thus leaving low and easy passes between. **Fusinoyama,**[6] the highest, is upwards of 12,000 feet in height.

The old lavas from these volcanoes, crumbled by vegetation and changes of weather and washed down by rain, have yielded to the plains and valleys an exceedingly rich soil,[7] and this, together with the warm summers and the copious summer (monsoon) rains, renders the low grounds so productive that, small as

[1] Chinese = 'Sea of Sand.' A portion of this desert extends even to the east of Khingan.

[2] See p. 292.

[3] This name, a Chinese one, is more familiar than the Japanese one, Riu-kiu, these islands having been claimed by the Chinese (as well as the Japanese) till 1879. The Chinese language has no *r*, the Japanese no *l*.

[4] See Introd. p. 51.

[5] See Introd. p. 37 and comp. p. 324.

[6] Also known as Fusiyama, Fujiyama, and Fujisan. *Yama* = 'mountain' in Japanese, *san* in Chinese.

[7] See Introd. pp. 25 and 37–8.

their area is, the density of the population in all the three more populous islands is upwards of 800 to the square mile. The principal summer crop is **rice** (the staple food of the people), but **barley** and **wheat** are largely grown as winter crops, the young grain springing up before the winter, and remaining green, but not growing all the winter through. **Tea** and **silk** are likewise staple products.

The Japanese, **mostly Buddhists in religion**, attained a high degree of civilisation before they came much into contact with Europeans and Americans, and their manufacturing industries had reached a corresponding degree of advancement. Their **silk fabrics** and **lacquered wares** are particularly celebrated, and their skill in lacquering has even given a word to our language (japanning). For a long period the Japanese showed the same jealousy of foreign intrusion as the Chinese, and foreign trade was strictly limited to Chinese and Dutch. Now, however, several ports have been opened to other nations, and foreign trade has been greatly extended in consequence. Still more recently the Japanese have begun to show an eager readiness to learn from Western nations: to teach European languages (especially English) in their schools, to employ foreign teachers of science in their colleges and universities, and to send Japanese students to the universities of Europe and America for education. At present the use of the extremely difficult Chinese mode of writing is a great hindrance to education, but an agitation is now on foot for the adoption of the Roman alphabet.

The capital of Japan, the residence (since 1869) of the Mikado, or ruler of the country, is **TOKIYO** (1,390), formerly called Yedo, situated at the head of an eastern bay, on one of the most extensive and best watered of the Japanese plains. It is a treaty port, but being accessible only for small vessels, the foreign commerce is chiefly centred at **YOKOHAMA**, another treaty port on the same bay. West-south-west of Tokiyo, about 7 miles to the south of a beautiful lake in another rich plain, is **KIYOTO** (280), capital of Japan for 1,000 years previous to Tokiyo, and still the chief seat of Japanese industry, the centre of Japanese art, and the most interesting of Japanese towns, in virtue of its general appearance and historical associations. **OSAKA** (476), and **Hiogo**, on the bay to the south, are its ports (both treaty ports). **Nagasaki**, in the south of the island of Kiusiu, is a treaty port, with one of the deepest and safest natural harbours in Japan. **Niigata** is the only port on the west coast, and is accessible to shipping only in summer, navigation being stopped by the strong surf created by the north winds of the winter monsoon.

AFRICA.

Approximate latitudes: (Cartagena) Cape Blanco, the northernmost point of the continent, 37½° N.; north of Lake Victoria Nyanza (Cape Romania), 1° N.; (Montevideo) Cape Agulhas, the southernmost point, 35° S.

Approximate longitudes: Cape Verde to Cape Guardafui, 17° W. —51° E.

AFRICA is a continent lying to the south of Europe, and bearing some resemblance in outline to the other great tropical continent of South America, inasmuch as it is broader in the north, and tapers towards the south, but, having a more northerly situation than South America, the broader part is not so entirely tropical as in that continent. Its total area is about eleven and a half million square miles, or two million square miles greater than that of North America; its population is very uncertain, but it is estimated at upwards of 200,000,000. Misgovernment, internal wars, and the practice of **slavery** keep down the density of the population almost everywhere in the interior.

The superficial features contrast markedly with those of all the other continents. Africa has no wide plains near the coast, but consists principally of plateaux, varying from about 2,000 to 9,000 feet in height, surmounted in many places by mountain chains, and generally sinking pretty rapidly to the coast, where the strips of lowland are comparatively narrow. The principal mountain ranges are those of the **Atlas**, which run parallel to the western half of the Mediterranean, and the **Drakenberg** [1] or **Kwathlamba Mountains**, in the south-east; the principal series of plateaux, one which begins in the south of the Red Sea and proceeds southwards nearer the east coast than the west, finally turning westwards in the north of the Zambezi basin.

Towards the east coast these plateaux are surmounted by two lofty mountains, **Kenia** and **Kilimanjaro**, rising within a short distance of the equator above the snow-line, hence to upwards of 16,000 feet. On these plateaux lie also a number of great **freshwater lakes**. The largest of all is **Lake Victoria Nyanza**, or **Ukerewe**, on the equator, a lake estimated to have an area of about 30,000 square miles, and hence little smaller than Lake Superior (32,290 sq. miles). To the south-west

[1] Dutch=Dragon Mountains. See p. 343 a.

is the long and narrow **Lake Tanganyika**, about half the size of Victoria Nyanza, and still further south **Lake Bangweolo**. East of the latter, on a lower plateau, is **Lake Nyassa**, about the same size as Tanganyika. All these lakes lie within the southern half of the torrid zone, except a small portion of Victoria Nyanza.

All the great rivers of Africa except the Nile belong wholly to the tropical portion of the continent.

The **Nile**, the longest of all, has its head-waters collected by Lake Victoria Nyanza, from which it issues in the north, and after touching the end of a smaller lake (**Mwutan**[1]), in the north-west, winds northwards to the eastern half of the Mediterranean. From Abyssinia it receives two important tributaries on the right, the **Bahr-el-Azrek**, or so-called Blue Nile,[2] and the **Atbara**, but in the lower half of its course it does not receive a single tributary on either bank. The other three great rivers of Africa, the Niger, Congo, and Zambezi, all describe great curves among the interior plateaux before making their escape to the coast through the bordering mountains. The **Niger**, rising far west, sweeps northwards, and then south-east and south, before it empties itself by a delta into the Gulf of Guinea. The **Congo** has its head-waters collected by Lake Bangweolo 12° south of the equator, and reaches 2° north before bending southwards again to enter the Atlantic Ocean in about 6° south. In respect of the volume of its water discharge[3] this river is by far the greatest of African rivers. The **Zambesi** has numerous headwaters in a region thickly streaked with rivers, partly belonging to its basin and partly to that of the Congo, between 10° and 15° south, and after describing an S curve enters the Indian Ocean (Mozambique Channel) by a delta opposite the middle of Madagascar. All these rivers are great navigable streams, but all of them have their navigation interrupted, in their lower course, by **falls and cataracts**. In the Nile, however, these are high enough up to allow of nearly 800 miles of unimpeded navigation from the mouth.

The nature of the surface, together with other circumstances, causes Africa, as a whole, to be very deficient in rain. It lies in latitudes where the atmosphere is always able to retain large quantities of vapour uncondensed,[4] and, consisting like Spain mainly of plateaux with bordering mountains,[5] its interior is in most parts reached only by winds that have been deprived of the greater part of their moisture. Hence the only regions with

[1] Sometimes called Lake Albert Nyanza; but since this lake, formerly supposed to be one, has been discovered to be made up of two lakes, the northern one is distinguished as Lake Mwutan, the southern as Lake Muta.

[2] *Bahr* is Arabic for a stream. *Bahr-el-Azrek* means properly the turbid stream, as distinguished from the *Bahr-el-abiad*, or white (that is, clear) stream (of the Nile itself above its confluence with this tributary).

[3] The discharge of a river is the volume of water it pours into the sea within a given time, usually expressed as so many feet per second. It is estimated by finding the breadth, the average depth, and average rate of a river at the mouth, and multiplying. [4] See Introd. p. 49–50. [5] See p. 263.

abundant rainfall are the western part of the equatorial area and narrow strips on the south and south-east coasts. Two regions of exceptional drought occur, one in the north and one in the south.

The former is the **Sahara**, extending from the Nile to the Atlantic, between the Atlas Mountains and the Eastern Mediterranean in the north, and the Soudan countries in the south, a region visited chiefly by dry winds from the Asiatic continent. Much of this vast area, measuring 3,000 by 900 miles, is absolute desert, sandy, stony, or rocky, but where there are temporary streams [1] or underground moisture there are inhabited oases, some of them thousands of square miles in extent. The other region of exceptional drought is in South-west Africa, north of the Orange River, where the dryness of the air is increased by a cold current which creeps along the south-west coast, and reduces the evaporation.[2] This region is known as the **Kalahari Desert**, though it is in fact mainly covered with thin grass, and is generally visited by copious dews at night.[3]

South of Sahara lies **Lake Chad**, a large freshwater lake, which in times of flood has an outlet on the north-east to a depression incrusted with salt. North of Kalahari is **Lake Ngami**, the outlet of which similary loses itself sooner or later in salt lagoons.[4]

The **vegetation** and animal life of Africa answer to the climate. **Dense liana[5]-bound forests** occupy the moist equatorial regions, but the greater part of the continent capable of supporting vegetation at all is occupied by **grassy plains** with trees only thinly scattered over them, or without trees at all. On these plains tall thick-stemmed leafless prickly euphorbias [6] are in many places conspicuous, and in the south there is an immense variety of bright-flowered woody heaths. In the desert almost the only vegetation consists of thorny shrubs or tufts of coarse grass [7] growing here and there, and in the oases the sole dependence of the people is the **date-palm**,[8] which loves a sandy soil, but can suck up moisture by its long roots from a great depth. The principal cultivated grain is durrah.[9]

The **characteristic animals** of the continent are **fleet-footed grass-feeders**, and above all **antelopes**, which are to be seen at certain times assembled in countless herds and in great variety along with **zebras**, **quaggas**, and other animals, at well-known watering places, where they are watched at evening by the lion, **hyæna**, and other beasts of prey. The swift-running bird, the **ostrich**, also scours the plains, and where there are clumps of

[1] Generally known by the Arabic name of *wadis*.
[2] See Introd. p. 51–2. [3] See Introd. p. 52–3. [4] See Introd. p. 31.
[5] Lianas are climbing and twining trees, such as are found in great abundance in all tropical forests. [6] See Introd. p. 59. [7] See cut, p. 26.
[8] See cut, p. 334. [9] See p. 302 *n.* 4.

trees small troops of **giraffes** may be seen grazing the lower twigs with the aid of their long necks, or galloping from clump to clump across the country. Elephants and rhinoceroses haunt the forests and marshes, and hippopotamuses and crocodiles are found in many of the rivers. Monkeys and apes (chimpanzee and gorilla) are found both among trees and among rocks.[1] In the desert the **camel** (single-humped) is as indispensable as a beast of burden as the date-palm is on account of its fruit.

The **inhabitants** of the north and north-east of Africa, including the Abyssinians (a Semitic people), Egyptians, and Berbers, as well as the Asiatic settlers, the Arabs and Jews, are all

FIG. 61.—KATRUN, AN OASIS IN FEZZAN SURROUNDED BY DATE-PALMS.

markedly different from those of the south and south-west, among whom the Negro features are more or less prominent. Among these features are protruding jaws, swollen lips, projecting heels, a black or very dark skin, and woolly hair, all of which are most highly developed in the true Negroes inhabiting the region to the south-west of the Sahara. The Jews are settled in considerable numbers in the Atlas States, and the Arabs are more widely diffused, being settled in large numbers in the north and east, and having the command of the trade (largely a slave trade) of a great part of East and Central Africa. The **Mohammedan religion** has been introduced by the Arabs into all North Africa,

[1] Comp. South America, p. 172.

East Africa as far south as the Zanzibar coast, and into the Soudan states between the Nile and the Niger basin; and in Central Africa Mohammedanism is constantly gaining ground. Ancient Christian sects survive in Abyssinia and Egypt (in the latter country called **Copts**). The rest of Africa is heathen, except where there are European settlers (chiefly English and Dutch colonists in the south).

COUNTRIES AND REGIONS OF AFRICA.

1. EGYPT, the country of the lower Nile, together with a portion of North-west Arabia, including the peninsula of Sinai, has an area of between 300,000 and 400,000 square miles; but so large a part of this is desert that the whole extent capable of cultivation is less than twice the size of New Jersey. This cultivated region is almost confined to the delta of the Nile (Lower Egypt) and the narrow valley, varying from ten to fifteen miles in breadth, which borders that river above the delta (Upper Egypt). There accordingly the immense majority of the six or seven million inhabitants of the country are settled, and the density of population is very high (above 600 to the square mile). In this nearly rainless region the regular **inundations** of the river occurring in autumn (in consequence of the monsoon rains of Abyssinia) supply both moisture and a fertile soil, as on the banks of the Euphrates and Tigris. Hence from the remotest period this valley has been the seat of a dense population, and in ancient times was occupied by one of the oldest of civilised nations, remains of which are to be found both in Lower and Upper Egypt. In Lower Egypt are the famous **pyramids** at the head of the delta opposite the modern Cairo; in Upper Egypt the ruins of the equally wonderful **temples of ancient Thebes** (at Luxor and Karnak).

At all times the principal occupation of the inhabitants of this valley has been **agriculture**, in the pursuit of which water-wheels and other irrigating apparatus are necessary. The principal products, besides grains grown both for food and for export, is **cotton**, which now forms by far the largest of the Egyptian exports. The cultivators (the fellahîn) are oppressed by a despotic ruler (the khedive), who is tributary and pays a nominal allegiance to Turkey,[1] but the government is at present to a large extent under English influence. The occurrence of petroleum

[1] Egypt was conquered by the Turks in 1517.

may ultimately give some importance to the otherwise unproductive part of Arabia which belongs to Egypt.

Railways connect the principal towns in the delta, and one line ascends several hundred miles up the Nile valley. The **Suez Canal**, which allows the largest ships to cross the isthmus of that name from Port Said, on the Mediterranean, to Suez, on the north-western arm of the Red Sea, runs through Egyptian territory.

The capital is **CAIRO** (375), at the head of the delta, near the site of the ancient Memphis, connected by the Mahmudieh Canal as well as by railway with **ALEXANDRIA** (230), which has in consequence greatly increased its population, though even in size it is still far behind what it was in ancient times, when it was the residence of the Ptolemies, and for centuries the chief seat of Greek culture, and numbered, it is said, about a million inhabitants.

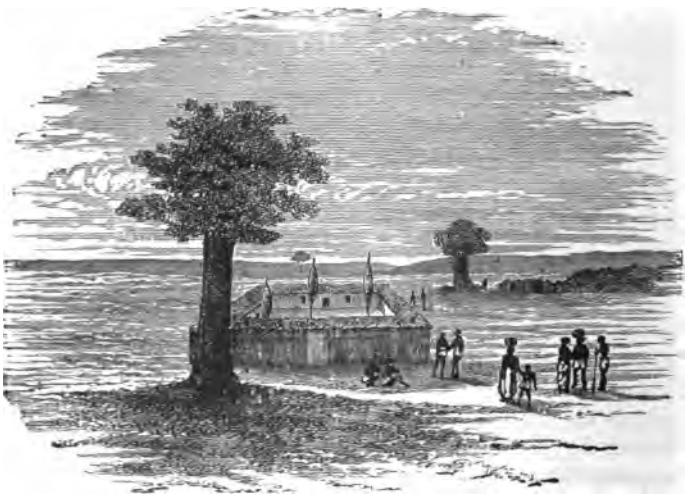


FIG. 64.—A TEMBE, ONE OF THE COMMONEST FORMS OF DWELLING IN CENTRAL AFRICA.

The name of **Egyptian Soudan** has been given since 1821 to vast regions in the south of Egypt, which, when the power of the khedive was at its highest, almost reached the equator, and brought up the area of his dominions to upwards of a million square miles.

These regions (**Nubia**, **Kordofan**, **Dar-for**, &c.) are extremely arid in the north, but with increasing rainfall as one goes southwards. The commercial and political centre of this region is **Khartum**, at the confluence of the White and Blue Nile; and **Suakim** (Sawákin), on the Red Sea, is the chief port. The Soudanese have become practically independent of Egypt through revolt, and the greater part of the country is now included in British East Africa.[1]

[1] See p. 345.

2. SOUDAN.—The term **Soudan** also embraces all the states south of the Sahara between the Nile and the sources of the Niger. The Soudan has recently been largely appropriated by European powers. The British hold the basin of the Lower Niger (300,000 square miles); the French the basin of the Upper Niger, or Western Soudan, with a protectorate over nearly all the Sahara from the Mediterranean States to Lake Chad (2,000,000 square miles); the German colony, Kamerun, extends nearly to Lake Chad. Around this same lake there remain the few independent native states of Africa.

Many parts of this vast area are thickly inhabited, especially near the angle of the Gulf of Guinea, where the rains are more abundant. Throughout this region a kind of palm, called the *deleb*, is almost as important for the food it yields to man as the date-palm further north. But the people also grow various kinds of grain and rear cattle. **Kuka**, the capital of Bornu, near the west coast of Lake Chad, is the largest town in the Soudan; but **Timbuktu**, situated on the edge of the desert, a few miles from the Niger north of its great bend, is better known in Europe from the fact of its being the centre of trade between Western Soudan and North Africa, the focus of numerous caravans which take their way thither between November and January.

3. WESTERN MEDITERRANEAN STATES.—(*a*). **Tripoli**, a vast region opposite Italy, with an area larger than Arizona, New Mexico, and Nevada, but in which the whole extent of cultivated land is estimated to be only about as large as the State of Delaware. The cultivated land lies chiefly on the coast, partly in the neighbourhood of the town of Tripoli, partly on the borders of the plateau of **Barka**, where in ancient times stood the Greek colony of *Cyrene* and the other towns of Cyrenaica. Tripoli, long a dependency of Turkey, is now administered as a province of the Turkish Empire. Population about one million. In this province, as in all the countries to the west, the population is mainly composed of Arabs, Berbers—a race peculiar to North Africa—and Moors, the last being a mixed race descended from the two others, and inhabiting the towns. On the whole line of coast (700 or 800 miles) there is only one seaport of consequence, that of **Tripoli**, which is chiefly important as the centre of the trade across the desert, the point of arrival and departure for camel caravans, through the oases of **Fezzan**, to Bornu, and south-westwards to Timbuktu.

(*b*). **Algeria and Tunis**, the former a French colony since 1830, the latter under French control, are both traversed by the parallel chains of the **Little** and **Great Atlas**, which in Algeria

leave only a narrow strip of well-watered cultivated land (the **Tell**), between the Little Atlas and the coast, while in Tunis the plateau which separates them, sinks down towards the Gulf of Tunis, and becomes the fertile valley of the **Mejerdah**, watered by a permanent river. The climate and products of the lowlands are similar to those of Southern Europe (see pp. 184–5). Round the city of **Algiers** are grown fine early vegetables for the London and Paris markets. **Alfa**, the only product of the plateau (which in Algiers has a breadth of more than a hundred miles), is one of the chief exports of the country, and is mainly sent to England for use in paper-making. Since Algeria has been occupied by the French, much has been done for the development of the country chiefly by the making of roads and railways, but also by the sinking of **Artesian wells.**[1]

French settlements in the colony have not been very successful, but in the portion under cultivation (chiefly the Tell) the Berbers (here called **Kabyles**[2]) are settling in increasing numbers. The Berbers are essentially an agricultural people, and present a complete contrast to the Arabs, who are pastoral and nomadic. These are therefore found solely in the remainder of the territory, which is under military government, and, above all, in the region south of the Atlas, the **Biled-ul-jerid**, or 'Land of Dates.' In the east of the territory a district occupied by shallow salt lakes, called *shotts*,[3] is beneath the level of the Mediterranean; and proposals have been made for piercing the intervening barrier and letting in the waters of that sea to submerge the district.[4] The whole population of Algeria, which, exclusive of the portion belonging to the Sahara, is nearly as large as California, is about 4,000,000. Tunis, with a much smaller area (one-third the size of California), has about two millions, and is hence much more densely peopled; and the town of **TUNIS** is the only one in the two countries with a population above 100,000. It stands on the Gulf of Tunis, about ten miles from the ruins of ancient *Carthage*. The coast towns of **Algiers** (in the middle), and **Oran** (in the west), and the inland town of **Constantine** (in the east) give name to the three civil provinces under French rule in Algeria.

(*c*). **Morocco**, a country subject to a Mohammedan despot, and generally known as the Empire of Morocco. Its area can only be vaguely estimated as somewhat less than that of Tripoli, but as in Algeria the bulk of the population is confined to a limited extent of fertile and comparatively well-watered

[1] Known in this region, however, long before the arrival of the French. See p. 30.

[2] The representatives of the ancient Numidians, who furnished the Roman army with its best cavalry. From among the Kabyles the *Zouaves* of the French army were at one time recruited, as the *Turcos* are still.

[3] Shotts also exist on the plateau. [4] The project is now abandoned as too costly.

land, called the Tell, extending along the base of the mountains.[1] To this country belong the **Atlas Mountains proper**, which, sweeping round from Cape Ghir on the west coast, attain as great an elevation as the Pyrenees, and ultimately merge in the coast mountains on the north, called **Er Rif**, and can hardly be regarded as continuous with the longer ranges which bound the plateau of Algeria and Tunis. This plateau extends only a short distance into Morocco. The area of the Morocco Tell is estimated as equal to about half the area of California; the total population of the empire is roughly calculated at about six millions; but nothing but good government and proper cultivation are wanted to make it much more numerous.

Almost all kinds of grain might be grown in abundance, and the country is also rich in minerals and timber. All the chief towns, **Fez**, the capital, and **Mekinez** in the north, **Morocco** in the south, lie at some distance from the west coast among the mountains. They are all manufacturing towns, and the preparation of the kind of leather to which Morocco gives name is still an important industry. Fez makes and exports great quantities of red cloth caps, which take their name from that city, and are almost universally worn in Mohammedan countries.

4. WEST AFRICA FROM THE SENEGAL TO THE CONGO.—Along the whole coast in this region English, French, and Germans have established at intervals trading stations and protectorates. The French have pushed their influence furthest into the interior—up the whole of the Senegal to the Upper Niger—and they have commenced the construction of a railway along the former river, which is navigable for about half its length, but higher up has its navigation stopped, like other African rivers, by rapids and cataracts. The French also claim a protectorate over most of the region between the Lower Congo and the Atlantic to the north of the Gaboon River. The centres of English influence are **Sierra Leone**, on the surf-beaten west coast, **Cape Coast Castle**, on the Gold Coast (the whole of which is now British), and **Lagos**, further east, on the Slave Coast. The two latter belong to **Upper Guinea**, which is a general name for that part of the west coast which looks to the south. The German stations are principally in the neighbourhood of the **Cameroon Mountains**, opposite the Spanish island of Fernando Po, in the angle between Upper and Lower Guinea; but Germany has also another small settlement to the east of the Gold Coast

[1] See Introd. p. 52.

called **Togo Land.** Two native states of some importance, **Ashanti** and **Dahomey,** also touch the coast, and the **Pepper Coast,** which runs from north-west to south-east, belongs to the republic of **Liberia,** which was founded early in the present century by some philanthropists as a home for freed slaves.

Agriculture is generally neglected, but where pursued rice and ground-nuts[1] are the chief products. The principal exports of this region are **palm-oil**[2] (especially from Lagos, the chief centre of trade on the whole of the Guinea Coast), **gold** (especially from Cape Coast Castle), **ivory** and **india-rubber** (obtained from a liana[3]); and the articles taken by the natives in exchange are chiefly coarse cotton and other cloths, rum, fire-arms, and gunpowder.[4] Coffee plantations, under the supervision of Europeans, have been tried in some places with success. For Europeans the coast, as everywhere else in tropical Africa, is very unhealthy.

5. THE CONGO FREE STATE.—Till 1877, when the Congo was descended by Stanley, the course of that river was unknown. The descent of the river on that occasion made known the fact that this magnificent stream affords **1,000 miles of uninterrupted navigation** between Stanley Falls (just before the river first crosses the equator) and Stanley Pool, about 800 miles from the mouth. On the next 200 miles numerous falls and rapids occur to interrupt the navigation. After Stanley's descent of the river an International African Association was founded, under the head of the King of the Belgians, for the exploration of Central Africa, and more particularly for the opening up to commerce of the Congo basin, which seems to be pretty thickly peopled.

With this view a road has been constructed to avoid the rapids, and a railway is now projected. Numerous European stations have been set up at various points along the course of the river, and steamers have been launched, which ply regularly between Stanley Pool and Stanley Falls. Finally, in 1885, a treaty was concluded between the chief European Powers, by which free trade was established throughout a large portion of Central Africa, including the Congo basin; and a portion of that basin, equal to about one-third the area of the United States, was set apart to form the Congo Free State, the management of which is entrusted to the International African Association. At the same time it was provided that special measures should be taken against the slave trade, the curse of the region. The trade of the region, at present small, is in the same articles as in the rest of Western Africa.

[1] A pod-fruit like the pea or bean, but having this peculiarity, that it buries its pods underground to ripen; hence the name.

[2] Used for soap-making, greasing the axles of railway carriages, &c.

[3] See p. 333, *n.* 5.

[4] The trade is largely carried on by barter, in which glass beads have a high value with the natives. A kind of shells called *cowries* circulate as money.

6. **PORTUGUESE LOWER GUINEA**, from the Congo to 18° S., a little beyond the river Cunene. In the north the left bank of the Congo belongs to Portugal for ninety miles up, and Portuguese territory extends about 300 miles inland to the Kwango, a southern tributary of the Congo. Here, as in most parts of Africa, there is a comparatively rapid rise from the coast to the interior, and next the coast there is an arid and nearly desert tract, which increases in width towards the south from about five to about 100 miles. At a distance of about 100 miles from the coast lie some of the richest and healthiest regions of West Africa, at an elevation of several thousand feet above the sea level.

On these higher parts **coffee** is an important product. The oil-palm is met with only in the north of the region, but **india-rubber** is abundantly obtained from the same liana as in the rest of West Africa, and **cotton** and **sugar** are grown for export. The number of whites among the population is only about 12,000, some hundreds of whom are Portuguese convicts. The chief seat of the Portuguese government is **Loanda** on the coast.

The coast regions of Portuguese territory become more and more arid as we advance southwards, no rivers in that region flowing all the year round to the sea, so that the population consists only of a few hunting and pastoral tribes. The British have founded a whaling station on this coast at **Walvisch**[1] **Bay**, about 1° N. of the tropic of Capricorn; but all the rest of the coast is now claimed by Germany, and a German station has been founded at **Angra Pequena**, a few degrees south of Walvisch Bay.

7. **SOUTH AFRICA.** — **The British possessions** in South Africa, including the protectorate of Bechuana Land, Zambezia, and Nyassa Land, embrace an area of nearly 1,000,000 square miles.

Cape Colony, south of the Orange River, but now including also Griqua Land West, north of that river, has an area equal to Washington, Oregon, and Idaho. In the southern and more populous part of the colony the rise from the coast to the interior takes place in well-marked terraces, the edges of which, facing seawards, present the appearance of mountains on the outside. The innermost terrace is bounded on the south by a true mountain range with peaks of from 5,000 to 6,000 feet in height, but the table-lands on either side are 3,000 feet in height or more. These table-lands are called **karroos**, and that which

[1] Dutch = Whale-fish. See p. 343 n. 1.

lies to the south of the mountain range just mentioned is in most parts at least seventy miles in breadth, and is known as the **Great Karroo.** The general slope of the karroos is towards the interior, but outside of the inner mountain range the rivers nevertheless all flow directly seawards, and break through the edges of the table-lands in deep gorges (*kloofs*).

The **climate** is warmer, yet not much warmer, than that of Oregon. The rains in the west are chiefly brought by the winter winds from the north-west, but are small in amount. The summer rains of the south-east, on the other hand, are brought by south-east winds (trade winds), and are copious on the mountain slopes; but the whole of the interior is extremely dry, and hence large tanks for water are a prime necessary in inland settlements. The karroos, which afford excellent pasture in the rainy season, are hard [1] and burnt up for the greater part of the year. The **Orange River,** though nearly as long as the Columbia, is on account of this drought a small stream navigable only for boats, and even for these only a few miles up.

With such a climate Cape Colony as a whole is more suited for the rearing of live stock than for agriculture. **Sheep-rearing** is in fact by far the most important industry of the colony, and wool (including the hair of the Angora goat [2]) forms about a half of the total value of the exports (not including diamonds). The rearing of **ostriches** is now likewise largely carried on. Besides the ordinary cereals, all kinds of fruit belonging to temperate and warm climates are grown, and the vine, introduced at the close of the seventeenth century by a small body of French Huguenots, is cultivated with moderate success. The principal minerals are copper in the north-west, coal and iron in the south-east, and (much more important than either of these) **diamonds** in the arid plains of Griqua Land West (first discovered there in 1867).

Railways have been introduced both in the east and west, and the main lines, after being carried through notches in the karroos and the inner mountain range, meet in the interior, and a single line continues through **Kimberley,** the centre of the diamond-bearing district, to **Vryburg.**

About two-thirds of the **people** of the colony (numbering in all less than 1,000,000) belong to the native races, the chief of which is that of the **Kaffirs,**[3] a very dark-coloured race, which under British rule is

[1] Karroo is a Hottentot word signifying 'hard.' [2] See p. 297.

[3] Kaffir is not a native, but an Arabic name, meaning 'infidel'—that is, heathen or non-Mohammedan.

increasing rapidly, and showing great capacity for a settled civilised life. The arid regions of the north-west are thinly inhabited, chiefly by **Hottentots** and **Bushmen**, degraded and dwindling tribes, living either as nomadic stock-rearers or as hunters (the Bushmen solely as hunters). The inhabitants of European origin are mainly of **Dutch and British** descent. The Dutch element was introduced in the middle of the seventeenth century, when South Africa was first colonised by that people,[1] and prevails along with the Dutch language in many inland parts in the west. The colony was acquired by the British in 1806, and since then the British element has been rapidly increasing, and the English language (that of legislation and commerce) is gradually spreading over the whole colony. Education is well provided for, and a university exists at **Cape Town**, the capital, which lies under the shelter of a flat-topped mountain, called **Table Mountain**, on a bay on the west coast in the south of the colony. **Port Elizabeth**, on Algoa Bay, is the chief seaport, and **Grahamstown** the chief town in the east.

East of Cape Colony proper lie **British Kaffraria** and **Basuto Land**, fertile and well watered regions, producing cattle and grain in abundance. **Bechuana Land**, north of Cape Colony, consists in the west chiefly of the Kalahari Desert, but the east is inhabited by the Bechuanas, another African race of cattle-rearers and maize-growers, and is said to contain many tracts suitable for settlement by Europeans. The town of **Shoshong**, in the north (a little to the north of the tropic of Capricorn), is a centre of inland trade.

Natal, north of Kaffraria, a British colony rather more than one-fifth of the size of Oregon, with a population of nearly half a million, the great majority being Zulus and other Kaffirs. It grows **sugar** and other sub-tropical products upon a low strip next the coast, cereals higher up, and the mountain slopes are clothed with dense forests. Sheep, cattle, and ostriches are reared. Capital, **Pietermaritzburg**, in the interior; seaport, **Durban**.

Zambezia and **Nyassa Land**, to the north and north-east of Bechuana Land, a large area estimated to comprise half a million square miles, has recently been added to the British Empire. It reaches from the German and Portuguese possessions on the west coast to Portuguese East Africa on the east coast, and includes all the interior country north to the Congo Free State, with Lake Tanganyika and Lake Nyassa on its north-east. The Zambezi River divides it into two nearly equal parts, called Northern and Southern Zambezia or British Central Africa and British South Africa, while the part adjoining Lake Nyassa is called Nyassa Land. The country is healthful for Europeans, and produces corn and other food crops, cotton, and cattle. Rich reefs of gold-bearing rock are at present the chief inducement to a white population, of whom above 3,000 have already settled at Fort Salisbury and other places. A telegraph line establishes communication with Cape Town, and railroads are soon to be built. The administration is in the hands of the British South Africa Company and an Imperial Commissioner.

[1] Hence the Dutch names of physical features.

2. The Republics.—Immediately to the north of Cape Colony and Natal are situated two republics founded by Dutch settlers (Boers[1]) from the Cape, who had become discontented with British rule. These are the **Orange River Free State**, and the **Transvaal**, now known as the South African Republic. The latter state now includes a part of the former Zululand, the maritime part of which is now British territory. To British Zululand belongs St. Lucia Bay, a harbour of little value.

8. EAST AFRICA.—1. The **Portuguese** possessions, entitled the **Free State of East Africa**, comprise about 300,000 square miles lying opposite Madagascar. The climate is unhealthy for Europeans,

FIG. 65.—SHOSHONG,[2] BECHUANA LAND, SHOWING THE ABRUPTNESS WITH WHICH MOUNTAINS RISE FROM LEVEL PLAINS IN ARID REGIONS.
(By the kind permission of Mr. C. G. Oates.)

on which account the mineral resources, though including gold, are but little developed. The abundant vegetable products and ivory are the chief exports, but greater importance attaches to the control of Delagoa Bay, the best harbour on the east coast, and of the Lower Zambezi, the chief route to the British interior. **Lourenço Marques**, on Delagoa Bay, and **Mozambique** are the chief towns; from the former a railway extends inland.

2. **German East Africa** includes the coast from Cape Delgado to a point opposite Pemba Island, and extends inland to the borders of Lakes Nyassa, Tanganyika and Victoria. The chief towns are on the sea-coast, **Dar-es-Salaam** and **Bagamoyo** being the leading ports. The exports, which are mainly collected by the Arab traders of the interior, include ivory, gum, caoutchouc, and seeds.

[1] A Dutch word meaning 'peasants.' [2] As until 1890.

3. Zanzibar.—The islands of Zanzibar and Pemba now form a British protectorate. Formerly the Sultan of Zanzibar ruled all the coast between Cape Delgado and the third parallel north of the equator, but in the years 1888–91 he parted with his power to Germans and English in return for fixed money payments. The town of **ZANZIBAR** has long been the centre of Arab trade of Eastern Africa, a trade which was very early developed, owing to the fact that the winter monsoon, or trade wind, favoured the voyage from Arabia, the summer monsoon the return voyage. Many exploring expeditions into the interior have started from here.

4. British East Africa has an area of about 1,000,000 square miles. Its coast is from five degrees south to the equator; thence it stretches north-west and north some two thousand miles to the Desert of Sahara and the border of Egypt, including nearly all the basin of the Upper Nile and much adjoining territory. The chief port is **Mombassa**, with an excellent harbour, from which a railway to Lake Victoria has already been begun, while a cable to Zanzibar puts it in communication with the world. It is expected that the advent of the railway, with its commerce, will largely aid in ending the slave trade so long carried on by Arab dealers.

Throughout the portion of East Africa just described, from the Zambezi northwards, merchandise must be carried by human porters, beasts of burden being killed either by the climate, or, in some places, by the tsetse fly, whose bite is fatal to horses and cattle. Farther north, in the drier **Somali Land**, which occupies the eastern angle of Africa, the camel can be used. The centre of the caravan trade in this region is **Harrar**, the Timbuktu of East Africa.

5. The sphere of **Italian** influence comprises numerous small realms between the British area and the coast, chief and most valuable among which is the ancient Christian kingdom of **Abyssinia**, with a Semitic population. Abyssinia is a mountainous land with considerable forest area and pasture land. The Italian seaport is **Massowah**, on the Red Sea, with exports of grazing products, ivory, gums, and pearls.

East of Abyssinia the ports of Berbera and Zeila are British, and Obock is French.

9. AFRICAN ISLANDS.—*(a)* **In the Atlantic Ocean.** Almost all these Islands are of volcanic origin, and most of them were uninhabited when discovered by Europeans. They all now belong to European Powers.

The **Azores**, usually considered as African islands, although by the Portuguese, to whom they belong, they are treated as a part of the kingdom of Portugal. The climate is healthy, and the islands are now covered with orange groves.

Madeira, also Portuguese, a favorite resort for invalids requiring a mild climate; noted also for its wine. The chief town is **Funchal**, a calling station for Atlantic steamers.

The **Canary Islands** belonging to Spain. On the largest island is an active volcano upwards of 12,000 feet high, known as the Peak of Teneriffe. Cochineal is now the principal product for export.

The **Cape Verde Islands**, belonging to Portugal. The island of St. Vincent, though arid and unfruitful, has a magnificent harbour, on which account it is often used as a calling station by Atlantic steamers.

The four **Guinea Islands** (in the angle between Upper and Lower Guinea) produce sugar, cacao, quinine, and other products. **Fernando Po** and **Annobon**, respectively the northernmost and southernmost, belong to Spain; the two middle ones, **Principe** and **St. Thomas**, to Portugal.

The three islands of **Ascension**, **St. Helena**, and **Tristan da Cunha** belong to Britain. Ascension is used as a store depôt and a sanatorium for the British West African squadron. It is celebrated for its turtles. St. Helena has a fine natural harbour, and is hence another place of call used by Atlantic steamers. On this island Napoleon was confined after the battle of Waterloo till his death in 1821.

(*b*) **In the Indian Ocean.** **Madagascar**, an island a thousand miles long and two hundred in average width. It has a mountainous core rising to nearly 9,000 feet in height and enclosed by plains traversed by lower mountains. A belt of dense forests surrounds the inner core. Rain falls most abundantly on the east coast, where accordingly the vegetation is most luxuriant, but where the climate of the plains is fatal to Europeans. In the south-west are steppes similar to those of Inner Africa, but without any of the antelopes and other large mammals of that continent—a proof that the island must have been separated from the mainland from a comparatively remote geological period.[1]

Rice and **manioc**[2] are the principal food-products. The ruling tribe is that of the **Hovas**, who belong to the Malay family, and accordingly have immigrated from Southern Asia. The earlier inhabitants, belonging to African races, are chiefly found in the outer parts of the island. The whole island is now under French protection. The capital of the country is **Antananarivo**, in the interior highlands.

Between the north of Madagascar and the mainland are the volcanic **Comoro Islands**, among which Mayotte belongs to the French; and east of Madagascar are other two important volcanic islands, **Mauritius** and **Bourbon**, the former belonging to Britain, the latter to France.

Both are important for the production of **sugar**, and, in respect of the quantity produced, Mauritius has no rivals among the British possessions except British Guiana. The labourers of this densely peopled island are principally Indian coolies.[3] Among the dependencies of the Mauritius are the **Seychelle Islands**, farther north, celebrated for their double coco-nuts.

[1] Comp. p. 363. [2] See p. 167. [3] See p. 313.

AUSTRALIA AND OCEANIA.

AUSTRALIA.

Approximate latitudes: (mouth of Rovuma River, Africa), northernmost point, Cape York (mouth of San Francisco River, South America), 11° S.; Adelaide (Buenos Ayres), 35° S.; southernmost point, Wilson's Promontory (Bahía Blanca, South America), 39° S.
Approximate longitudes: 113° to 153° E.

THIS vast island or continent is nearly three millions of square miles in extent, and thus almost exactly equal in size to the United States exclusive of Alaska, and a good deal more than three-fourths of the size of Europe. In the nature of the coast-line, the character of the surface, the climate and productions, it presents no little resemblance to the part of Africa with which it corresponds in latitude.

Its coast-line agrees with that of Africa generally in being remarkable for its long stretches of uniform character, without inlets that can be made use of by shipping even for shelter. As in southern Africa, the part of the coast which is on the whole richest in inlets and natural harbours is that in the east and south-east. On the south coast, on the other hand, the long, gently curving coast-line which forms the **Great Australian Bight** is one unbroken stretch of sandy beach, backed by barren cliffs a few hundred feet high. Between **Spencer Gulf**, which is the principal gulf on the south coast, and **Cape Leeuwin**, the first cape sighted by vessels coming from Europe by Suez or the Cape of Good Hope, the only good natural harbour is that of **King George's Sound**, about 200 miles from that cape. Equally uninviting is a large part of the west and north coast. On the shores of the warmer seas, within and near the tropics, there are long stretches of mud-flats covered with **mangroves** (see p. 58). Such, for example, is the character of a large part of the coast-line that borders the shallow waters of the **Gulf of Carpentaria**, the great gulf of the north coast.

Off the whole of that part of the east coast of Australia which trends from south-east to north-west and ends in **Cape York** numerous coral

FIG. 66.—WATERFALL GULLY, NEAR ADELAIDE.

reefs (see p. 33 *n*) rise to the surface of the water, making the seas somewhat dangerous to shipping; and about one degree north of the Tropic of Capricorn there begins a series of coral reefs such as are to be seen nowhere else in the world over the same extent of sea. These form together the **Great Barrier Reef.** The whole length of the reef is about 1,200 miles, for it advances into the latitude of Torres Strait, which it nearly closes. The widest part of the reef is in the south, where it extends for about 100 miles from east to west, and in that part also it lies furthest from the coast. At low tide the surface of the reef is just about the level of the surface of the water, and at all states of the tide the edge of the reef can be distinguished by the strong breakers that wash over it. The reef, however, is not continuous. It is broken up by many deep channels, some of which are narrow, others from 10 to 12 miles wide. To seamen these channels are of importance, as allowing a choice of routes (an inner and an outer) between the seaports in the east of Australia and Torres Strait.

Torres Strait itself is greatly encumbered by the work of the coral-builders. The hundred miles of shallow sea here left between Cape York and the coast of New Guinea, besides being studded with numerous small islands, are crowded with coral reefs and sandbanks, amongst which there are only one or two safe channels for shipping.

The chief feature of the **surface** of Australia, as of that of South Africa, is a range of highlands running from north to south near the east coast, and then turning westwards. In Australia it ends in that part of the continent that juts out furthest to the south. Throughout its length it is known as the **Dividing Range,** and it is a dividing range in more senses than one. It varies in character in different parts. In some places it is a plateau, and presents the appearance of a steep mountain range only on its outer or eastern face. In some places the plateau is crowned by mountain ranges running in different directions. In the south-east, where the highest elevations occur, it forms a true mountain range sinking down to plains on both sides.

This part of the Dividing Range is known as the **Australian Alps,** a range of about 400 miles in length. It is densely wooded, except near the tops of the highest summits, which occur in groups on small elevated table-lands. The highest peak of all is 7,350 feet above sea-level. It belongs to the **Kosciusko Group,** and has been named **Mount Townsend** in honour of the surveyor by whom this part of the Australian Alps was first named. The group to which it belongs lies near the north-eastern end of the range, within the borders of New South Wales (see p. 356).

The interior of Australia, like that of South Africa, consists for the most part of broad stretches of level or rolling country. In the east of Australia the surface is high; in the middle there are

low plains, and the western half of the continent, so far as it has been explored, consists mainly of a table-land of about 1,000 feet above sea-level.

The Dividing Range forms an important line of division in the climate of Australia, inasmuch as there are hardly any parts of the continent within this range which have a plentiful supply of rain unless they lie within the tropics. In most parts of Australia the most abundant rains are brought by winds from the eastern or southern seas, and the mountains in the east and south-east have their usual effect of causing the rainy winds to lose most of their moisture on the side facing them.[1]

The prevalence of easterly winds in temperate Australia, as in South Africa, is due to the latitude, which is that in which the trade-winds[2] blow over the ocean. The existence of such large masses of land modifies the direction of the winds, but not to such an extent as to cause strong rain-bearing winds to blow from the western seas. Moreover, the summer is the period of the year at which there is the greatest tendency for the winds to blow inland in consequence of the great heat and rarefaction of the air on the land,[3] but that is the period of the year when most vapour can be retained in the air without condensation.[4]

The result is that there are vast tracts in the interior of Australia that are absolutely desert, and for ever doomed to remain without inhabitants, these lying more to the west than to the east, and there are other large areas that can produce only a scanty herbage, fit for nothing but sheep-rearing, and in many places not to be depended on every year even for that. A large part of tropical Australia has abundant summer (monsoon) rains,[5] and there are small areas in the south-west and south which have the rainfall chiefly in autumn and winter.

The nature of the climate of Australia explains that of the Australian rivers. Most of those which enter the sea on the east and south-east of the Dividing Range are comparatively short, but are, as a rule, well supplied with water all the year round. All the great rivers take their rise on the inner slopes of the Dividing Range, and flow towards the west or south-west. Only one of these, the **Murray**, enters the sea by an independent mouth.

This river takes its rise in the Kosciusko group of the Australian Alps, and flows on the whole westwards, but finally turns south-west before entering the sea. The Murray itself, and its two great tributaries on the right bank, the **Murrumbidgee** and the **Darling**, might be reckoned

[1] See p. 52 (3) (*a*). [2] See p. 39. [3] See p. 38 (under Winds).
[4] See pp. 49–50. [5] See pp. 42 and 51 (*b*).

among the great rivers of the world in respect of their length, for they are all much more than 1,000 miles in length, but the climate of the region causes them to be very scantily supplied with water. The Darling even dries up in summer in many places into a chain of small lakes. The shorter feeders on the left bank of the Murray help to keep that river more constantly supplied with water through the melting of the winter snow of the Australian Alps.

Though shallow, all these rivers can be made use of for a longer or shorter period of the year by small steamers, which ascend for many hundreds of miles into the interior. Unfortunately for Australia, however, this river navigation is greatly impeded at the river mouth. In the region in which the Murray enters the sea, the coast-line is formed by a long line of sand-dunes, which at the mouth of the river give place to a bar (p. 27), the navigable channels in which are dangerous and shifting.

Many of the rivers of the Australian plains end by drying up in the sands, or in swamps, like the **Diamantina**, and others flow into large shallow **salt lakes** (see pp. 29, 31), which are a highly characteristic feature of the interior of Australia. Of the rivers that end in this way, the chief is the **Barcoo** or **Cooper's Creek**,[1] which in times of flood is a broad stream flowing into **Lake Eyre**, but in dry periods does not reach this lake.

Besides Lake Eyre, **Lakes Torrens** and **Gairdner** in South Australia and **Lake Amadeus** in West Australia may be mentioned as among the chief salt lakes belonging to the continent.

The use of the great rivers of the plains as navigable highways and for the watering of flocks is the most important to which they have yet been put, but the gradual slope of the plains over which they flow seems likely to admit of their being employed in the future to irrigate large tracts of country, to which they will then become as valuable as some of the rivers of Spain and Italy are to the land on their banks (see pp. 264, 266 (2), 271).

The **vegetation** and animal life of Australia are highly peculiar —so different from those of the rest of the world, as to show that this great island cannot have had any land connection with the continent within a recent geological period.[2] The **characteristic trees** are many different kinds of **eucalyptus**, some of which grow to a greater height than even the tallest giants of the Sierra Nevada.[3] They do not, however, grow, like these latter trees, in dense forests, but are somewhat thinly scattered over the surface.

Their roots are long, so as to be able to suck up moisture from a considerable depth;[4] their leaves narrow, and in full-grown trees,

[1] *Creek* is used in America and the Australasian colonies in the sense of a small river, or a river with little water in its bed.

[2] Comp. pp. 346, 363.

[3] See p. 76. Some of the commonest kinds of eucalyptus are popularly known in Australia as gum-trees, from their containing a gummy sap. The species most widely introduced into other countries is the so-called "blue gum."

[4] Comp. the date-palm, p. 333.

FIG. 67.—A KANGAROO HUNT.

attached in such a manner that their edges are above and below instead of sideways. In this position they are not so apt to give off vapour as the leaves of trees of moister climates, and their texture also fits them in several ways to retain moisture.[1] **Acacias** are also very numerous and characteristic, and many of them when full-grown lose their leaves and preserve in their place only flattened leaf-stalks attached like the leaves of the eucalyptus.

True forests (mostly with a dark and gloomy foliage) are found chiefly on the well-watered slopes of the eastern mountains. In many parts of the interior dense thickets of bushes or low trees (**scrub**), sometimes thorny, form an almost impenetrable barrier to progress. Many kinds of native grasses cover the ground, among which the tall **kangaroo grass** is valuable for its power of withstanding long drought. On some of the salt plains grows a shrub known as the **salt-bush**, which forms a valuable fodder-plant—in some places, and especially in dry seasons, the only one.

Among **animals**, Australia possesses, in place of the mammals of the great continents, a great variety of **marsupials**, a group scarcely met with outside of the Australian region,[2] and of which the kangaroo is the best-known representative. From other mammals the group is distinguished by the fact that in most species the female has a pouch (Latin, *marsupium*), in which it carries about its young for some time after birth.

The native Australian dog, the **dingo**, is not a marsupial, but was probably introduced at some remote date by man. **Rabbits**, which have been introduced more recently, have multiplied to such an extent as to have become a real plague, through the ravages which they commit in the pastures. There are no monkeys even in the tropical parts of Australia, but **parrots** and **cockatoos** abound, and a running bird, the **emu**, resembling the ostrich of Africa and the rhea of South America, scours the plains. **Alligators** are found in all the rivers within the tropics.

The **native Australians**, a very dark-coloured race, were at the time of the discovery of Australia by Europeans in a very backward state, and have since made no advance in civilisation. Having no domesticated species of animals yielding milk, and no cereal or other food-crops suited for agriculture, they had not the means of living a settled life, and were condemned to live by hunting and fishing, and gathering the poor fruits and edible seeds and roots afforded by a few of the native trees and herbs. A few boughs or pieces of bark form their only shelter, and their clothing consists of a scanty covering of skins or matting. At no time were they numerous, and since the arrival of Europeans they seem to be quickly dying out.

[1] Comp. the Mediterranean region, p. 184, and Introd. p. 59.

[2] The opossums of America belong to this group, which, however, has no living representatives in Europe, Asia, or Africa.

The present inhabitants are mainly colonists. The majority are of British origin, but latterly there has been a large German element. Now there are also many thousands of Chinese (nearly all men), and Polynesians from the islands of the Pacific have been introduced in considerable numbers as labourers into the tropical parts. The colonisation of the island began in 1788, after the eastern coasts had been surveyed by Captain Cook, and the first people settled here were convicts. Free colonists first began to settle in great numbers after the discovery of rich gold deposits in 1851, but the great and growing wealth of Australia consists in its sheep-pastures, no other part of the world, taken as a whole, being so well adapted for the production of wool.

Politically, Australia is now divided among five British Colonies, the government of which is in most cases modelled more or less on that of the mother country. By an Act passed in 1885, the Australasian Colonies, including New Zealand, Tasmania, and Fiji, were authorized to form a federation, which is to have the right of dealing with matters of common interest, and in 1891 a convention, called the National Australasian Convention, was held at Sydney, which framed a Bill to constitute the 'Commonwealth of Australia.' This Bill is now under consideration by the various colonial Parliaments.

The following table gives the names of the Australian Colonies, including Tasmania and New Zealand, with other particulars relating to them:—

Colonies.	Area in thousands of square miles.	Ratio to Great Britain.	Population in thousands.		Increase per cent.	Number per head of population in 1891.		
			1881.	1891.		Sheep.	Cattle.	Acres under crop.
Victoria . . .	88	1	862	1,140	32	11·	1·5	2·30
New South Wales	309	3½	751	1,134	51	49·	1·7	1·09
Queenaland . .	668	7½	214	394	84	46·	14·1	0·57
South Australia .	903	10	280	315	12	22·	1·1	8·41
West Australia .	1,060	12	29	50	72	50·	2·6	2·44
Tasmania . . .	26	¼	116	147	27	11·	1·1	3·52
New Zealand . .	104	1⅐	490	627[1]	27	28·[2]	1·5[2]	2·05

[1] Exclusive of Maori (see p. 362). [2] 1896–7.

Railways now extend for hundreds of miles inland from various places on the coast, and at the end of 1887 the last links in the series of lines connecting all the Australian capitals, from Adelaide in South Australia to Brisbane in Queensland, a distance of about 1,800 miles, were approaching completion. Already the series is so far complete that the port of Adelaide has become "the Brindisi of Australia," the place at which all the mails are collected and landed by vessels following the south coast route. Since 1872 the Australian Colonies have been connected by **electric telegraph** with the rest of the world through the completion of the great overland line, which crosses the colony of South Australia between Adelaide and Port Darwin, and is there connected with a submarine line to Java.

In the **commerce** of the Australasian Colonies taken together, the chief exports are wool, gold, and grain, and the chief imports from distant countries manufactured articles, such as cotton, woollen, and linen goods, clothing, iron, and articles made of iron, and other metals. The importance of this commerce to the mother country is shown by the fact that, notwithstanding the comparatively small population, these colonies received on an average, during the period 1889–90, more than one-eighth in value of all the exports of British and Irish produce from the United Kingdom, or about two-thirds as much as India with its enormous population.

THE AUSTRALASIAN COLONIES.—A. Victoria, the smallest colony on the mainland of Australia. It lies to the south of New South Wales, from which it is separated mainly by the **Murray River.** It was a dependency of New South Wales till 1851. The eastern half of the colony is to a large extent occupied by the **Australian Alps** and their spurs. The highest mountain belonging to this range in Victoria (and the highest in the colony) is **Mount Bogong.** In the western half of the colony the Dividing Range goes by various names. The chain containing the highest summit in this part of the colony is called the **Grampians.** The district to the south of the Australian Alps is called **Gippsland,** and is partly a region of dense forests with few inhabitants, partly a region with rich pasture-grasses, forming the principal horse and cattle rearing part of the colony. In the north-west is the district called **Wimmera,** at present mainly a waterless desert, but containing a tract on the borders of the Murray on which large irrigation works are projected. Victoria is the colony which has produced the largest amount of **gold,** though the annual yield is now less than that of Queensland. The production of **wool** and **wheat** is, however, increasing, and in recent years Victoria has become noted even in Europe for its **wine.**

The capital is **MELBOURNE** (including suburbs within ten miles 490), on the Yarra, a short distance above its mouth in Port Phillip Bay. It was founded on an uninhabited site in 1835, just after the discovery of rich pastures in the neighbourhood, and named after the British Prime Minister of the day. It is the seat of a university. On a western arm of this bay stands the port of **Geelong**. In the interior north-west of Melbourne is **Ballarat**, the centre of the richest alluvial gold-field ever opened up, but which is now to a large extent exhausted, gold being now mainly obtained not by digging, but by the crushing of quartz rock. In a more northerly direction from Melbourne lies **Sandhurst**, the chief centre of quartz-crushing. On the Murray, **Albury**, at the head of the ordinary navigation of the river,[1] and the place where the river is crossed by the railway to Sydney; lower down, **Echuca**, at the place where the river makes a sharp bend to the north-west,[2] and where another railway now crosses into New South Wales.

B. New South Wales, so called by Captain Cook, who was reminded of the Wales of Great Britain by the appearance of the mountains which he saw from off the coast. It was in this colony that the first settlement was founded in Australia, namely, on the magnificent natural harbour of **Port Jackson**, the harbour of Sydney, which has few rivals in the world either for beauty or convenience. Throughout this colony the Dividing Range forms a more continuous barrier between the coast lowlands and the interior plains and tablelands than it does in Victoria, and it was long before the settlers found a way across the **Blue Mountains**, as the part of the Dividing Range behind Sydney is called. The interior is traversed by the chief tributaries of the Murray, and the treeless plains which lie to the north of the Murray, and are noted for the fine quality of their wool, are hence known as the **Riverina**. Besides **gold**, **tin** is found in large quantity (mostly near the northern frontier), and New South Wales possesses the **chief coalfield** worked **in the southern hemisphere**. Great **silver** deposits have begun to be worked in the extreme west.

The capital is **SYDNEY** (including suburbs 386), so named after Viscount Sydney, who first suggested the establishment of the colony. At the head of the so-called Parramatta River, which is in reality a prolongation of the inlet of Port Jackson, stands **Parramatta**, in a district noted for its oranges. North of Sydney, on the estuary of the Hunter River, is **Newcastle**, the chief coal-mining town, to which fact it owes its name.[3] The coal from this port is now despatched not only to all the other Australian colonies, but also to India, China, South America, and even San Francisco. **Bathurst**, on the table-land behind Sydney, is the centre of the chief wheat-growing region of the colony.

[1] See p. 61 (2) (*d*). [2] See p. 61 (2) (*b*). [3] Comp. p. 201.

C. **Queensland**, the colony to the north of New South Wales, once, like Victoria, a dependency of New South Wales, from which it was separated in 1859. It includes all the islands in the narrowest part of Torres Strait. The surface consists mainly of table-land above 1000 feet in height, and the district in the south-east known as the **Darling Downs**, on which are the finest pasture-grasses in the colony, is about 2,000 feet high, and thus has a comparatively cool climate for its situation within five degrees of the Tropic of Capricorn. Extending far into the Torrid Zone, Queensland has more varied products than the more southern colonies. Among the tropical and sub-tropical products are cotton, arrowroot, ginger, coffee, fruits, and at present **sugar-cane**, which is largely grown in the low river-valleys on the coast. The **chief minerals** are **gold, tin,** and **copper.**

Labourers are obtained for the sugar-plantations from the islands of the Pacific, bargains being made with the natives to come and work for the planters for a term of years; but by an Act of the Queensland Parliament this mode of obtaining labourers is to cease in 1890.[2]

The capital of the colony is **Brisbane**, 500 miles north of Sydney, situated on both sides of the Brisbane River, at the head of navigation for large sea-going vessels.[1] **Toowoomba**, on the table-land to the west of Brisbane, is the chief town on the Darling Downs; **Stanthorpe**, near the southern frontier, the chief tin-mining centre; **Gympie**, the chief gold-mining town in the south; **Charters Towers**, the chief gold-mining town in the north. **Rockhampton**, close to the Tropic of Capricorn, at the head of navigation on the Fitzroy River, is the second town in population in the colony, the outlet for a rich and extensive pastoral district, as well as for districts producing gold and copper. All these towns are within a hundred miles of the east coast.

D. **South Australia** does not answer to its name, but extends from south to north to the west of the three colonies already treated of. It was founded in 1834 by an Act of the British Parliament, and at the time of its foundation was expected ultimately to include the territory belonging to Victoria. Most of the inhabitants are confined to a comparatively small district in the south, which is the only part of the colony in temperate latitudes that receives a fairly large supply of rain (chiefly in winter). This is the district traversed by the **Mount Lofty Range** and the **Flinders Range** of mountains to the east and north of Spencer Gulf and the Gulf of St. Vincent. This colony is the principal **wheat**-growing colony of Australia, and wine and

[1] See p. 61 (1) (*b*). [2] Restored in a modified form in 1892.

olives are also among its products. From an early date **copper** has been its chief mineral, while **silver** stands second in importance. The total output is small as compared with that of the eastern colonies.

Irrigation by Artesian wells[1] and other means is practised in the drier parts of the colony, and there is now a project for carrying out large irrigation works in the north-east in a district bordering on the Murray River. Irrigation by Artesian wells is found to be practicable at several places in the neighbourhood of Lake Eyre, which is the lowest lying part of Australia. Further north the telegraph line passes through many well-grassed regions, which may some day be settled, and other grassy tracts are now known to border some of the river-courses. The most important of these rivers is the **Finke**, which flows south-eastwards from the **MacDonnell Ranges** (on the Tropic of Capricorn), but dries up before entering Lake Eyre.

The northern territory of Australia is tropical, and the few inhabitants are mostly Chinese.

The capital of the colony is **ADELAIDE**, situated on the plain near the east side of the Gulf of St. Vincent. It was founded in 1837 and named after the queen-consort of William IV. About seven miles from the city stands **Port Adelaide**, on a small inlet opening out of the Gulf of St. Vincent. This port can be reached by tolerably large ships, but the largest ocean-steamers have to touch at quays on the gulf itself. **Burra Burra**, about a hundred miles north of Adelaide, is the seat of the chief inland copper-mines, but the principal copper-mines in the colony are those of **Moonta**, on the peninsula between Spencer and St. Vincent Gulfs. From a neighbouring port some of the ore is shipped for smelting to Newcastle in New South Wales in vessels which bring back coal to carry on smelting at the South Australian port.

E. **West Australia**, the largest but the least populous of all the colonies. The vast deserts belonging to it will always cause it to be more imposing in extent than population, and even in the principal settled area, the district in the south-west, which receives autumn and winter rains brought by north-west winds corresponding to the south-west winds of western Europe,[2] the population is very sparse. Fine hard **timber** has always been an important product of this colony.

In the northern parts of West Australia pearl-fisheries are carried on along the coast; a gold-field has been discovered in the interior, and good pasture-lands are now attracting settlers. The chief pastures are in **Kimberley District**, along the banks of the **Fitzroy River**, which flows into **King Sound** about 17½° S.

The capital of the colony is **Perth**, on the Swan River, about twelve miles above its port, **Fremantle**, on the west coast. **Albany**, on King George's Sound, 260 miles distant from Perth, is the place where the first settlement was made on West Australian territory (in 1826). Since

[1] See Introd. p 30-1.

[2] See pp. 41, 184.

the close of 1886, a railway intended to connect Albany with the line that already runs eastwards from Perth has been in progress, and this railway, it is hoped, will attract settlers to this hitherto unoccupied region.

F. **Tasmania.**—This colony consists of the island so called, together with the smaller islands adjacent. It is separated from Victoria by Bass Strait. Like Victoria and Queensland, the colony was originally a dependency of New South Wales, and the first settlement upon it was a convict establishment formed in 1803, but it was made independent in 1825. At that time the island was known as Van Diemen's Land, the name given to it by its discoverer, the Dutch navigator Tasman, in honour of the governor of the Dutch possessions in the East Indies at the time of the discovery; but the name was afterwards changed to Tasmania in honour of the discoverer himself. The surface of the main island is in great part high. A bleak table-land from 2000 to 3000 feet in height occupies the middle and a large part of the western half of the island, and is crowned by mountains and cleft by deep chasms through which issue the torrents which come to form the rivers of the west coast. To the east of this table-land lies a tolerably level and open district, which forms the great grazing ground of the colony. Elsewhere the colonists have had to contend with land more or less heavily timbered. The climate is a warm temperate one, well adapted for all crops of the middle part of the temperate zone, and specially well adapted for fruits. **Tin** and **gold** are important minerals, and coal-mines are also worked.

At the time of its settlement by the British, Tasmania was inhabited by a race not unlike the Australians, but having curly instead of straight hair. These people were treated by the settlers with no little cruelty, and soon began to die out rapidly. The race became extinct in 1876.

The capital of the colony is **Hobart**, situated at the end of the island furthest from Australia, an inconvenience which is, however, outweighed by the excellence of its harbour, formed by the estuary of the Derwent. **Launceston**, the next town in size, is situated at the head of navigation on the Tamar, forty miles from the mouth of the estuary known as **Port Dalrymple**, on the side of the island nearest to Australia.

G. **New Zealand.**—This colony (first settled in 1840) consists mainly of two large islands and one smaller one situated at the distance of about 1,000 miles from the nearest points of the south-east coast of Australia. The large islands are usually

known as the **North** and the **South Island**, and are separated from each other by **Cook Strait**. The smaller island is called **Stewart Island**, and is separated from the South Island by **Foveaux Strait**.

Besides the main islands just mentioned, New Zealand possesses several groups of small islands at the distance of from 150 to 350 miles. The principal are the **Chatham Islands** to the east, the **Auckland Islands** to the south, and the fertile group of the **Kermadec Islands** to the north-east (the last annexed to New Zealand in 1887).

The **coast-line** of New Zealand is in most places high and rocky, especially on the west coast. In the extreme south-west it is broken up by numerous inlets, with very steep and lofty cliffy shores, resembling the **fiords** of Norway.[1]

The **surface** of all the islands is **highly mountainous**. One long succession of mountains runs through both islands from the extreme south-west to the extreme north-east. It is interrupted by Cook Strait, and divided by gaps into a number of chains, to which different names are given. In the South Island these mountains lie for the most part close by the west coast, and it is about the middle of this island that the highest part of the whole series is found. This part is called the **Southern Alps**, and, like the Alps of Europe, they are crowned by perpetual snow, and have their higher valleys filled with large glaciers, and their lower valleys occupied by large and picturesque lakes.

The highest summit of the Southern Alps, **Mt. Cook** (named after the celebrated navigator who was the first among Englishmen to visit these islands), attains the height of 12,350 feet, about 3,500 feet lower than Mt. Blanc.

The mountains that continue the series of the South Island lie on the east side of the North Island, but the loftiest peaks of this island are in the west, and are all of volcanic origin. They lie in one of the most remarkable volcanic regions in the world.

Tongariro, near the middle of the island, is the chief active volcano, the crater of which is known by the name of Ngaurohoe. A little to the south is **Ruapehu**, 9000 feet high, the loftiest summit in the island, a volcano now nearly extinct. Apart from these, the regular volcanic cone of **Mt. Egmont** rises in the west from plains of great fertility. **Lake Taupo**, the largest lake in New Zealand, is considered by some to be the crater of an extinct volcano of immense size, and still further north, hot springs, geysers, and other signs of volcanic action

[1] See p. 257.

abound all the way to the **Bay of Plenty**, which is studded with volcanic islets. The small **Lake Rotomahana**, about thirty miles from the Bay of Plenty, used to be visited by travellers from all parts of the world on account of the beautiful pink and white sinter[1] terraces, which had been formed by hot springs on its shores, but in the middle of 1886 these were destroyed by a tremendous volcanic outburst which overwhelmed the whole neighbourhood.

The most extensive plain in New Zealand is that known as the **Canterbury Plains**, which occupy the middle of the South Island on the eastern side, extending for upwards of 100 miles from north to south, with a varying breadth.

The **rivers** of New Zealand are numerous, but the longer ones are, for the most part, unfit for navigation. Those of the South Island are mostly rapid torrents, fed in summer by the melting snows and glaciers of the Southern Alps.

The chief navigable river is the **Waikato**, which drains Lake Taupo, and enters the sea on the west of the North Island. The **Molyneux** or **Clutha**, a noble stream draining south-eastwards three of the chief lakes at the base of the Southern Alps, is the largest river of the South Island.

The **climate** of New Zealand is not characterised by the liability to droughts from which so much of Australia suffers. The **prevailing rain-bearing winds** are from the north-west, as in the south-west of Australia,[2] and hence the western slopes of the mountains and the plains at their base are plentifully supplied with rain, whereas the plains on the east have a much more scanty rainfall.[3] Hence the **forests** are chiefly on the west side of the mountains, and the Canterbury plains are the chief pastoral and agricultural region in the colony. The **temperature** resembles that of England more than that of Italy, with which New Zealand corresponds in latitude.

The New Zealand crops, therefore, are similar to those of England (the chief grain crops wheat and oats), and though grapes are grown in the open air in the northern districts, wine cannot be made from them. The more abundant rains of New Zealand cause the pastures to be richer than those of the Australian colonies (except Queensland), and hence live-stock, butter and cheese, wool, and of late great quantities of frozen meat are exported, the last especially to England.

The **native plant and animal life** of New Zealand are to a large extent different from those of Australia. New Zealand has no native eucalypts, and no native acacias, no native marsupials.

[1] See p. 30. [2] See p. 358. [3] See p. 52 (3) (*c*).

The most valuable native tree is the **kauri pine**, which is confined to the northern end of the North Island. It yields a fine timber, and the finest of all resins, the well-known kauri gum. Large lumps of this hardened gum are dug out of the ground on the sites of old forests of this tree. The so-called **New Zealand flax**, a plant with long sword-shaped leaves, yields a very strong fibre, well suited for rope-making. Among native birds is a wingless bird called the apteryx or kiwi, and many skeletons exist of an extinct bird called the **moa**, which is one of the largest running birds that ever existed.

The **minerals** of New Zealand are of great value, the chief being **gold** and **coal**.

The natives of New Zealand, called the **Maori**, are the most intelligent of all the natives whom the Europeans met with on any of the Australasian colonies. They are a brown-skinned,

FIG. 68.—NATIVES OF NEW ZEALAND (MAORI).

well-formed people, fond of tattooing themselves. Their whole number is little more than 40,000, and most of these liv on the North Island.

The capital of the colony is **Wellington**, in the south of the North Island, on an inlet from Cook Strait, forming a safe and commodious harbour. It is about 1,200 miles from Sydney, 1,400 from Melbourne. **Auckland**, on a narrow isthmus of the long peninsula of the North Island, which runs out to the north-west, is the largest town in New Zealand, and was once the seat of government. It is a calling station for steamers from San Francisco to Sydney, and as it lies on the east side of the isthmus (the west side having only a shallow harbour), vessels from Auckland to Sydney have to sail round the northern end

of the island. In the South Island the chief towns are Christchurch and Dunedin. **Christchurch** is the principal town on the Canterbury Plains. It is situated a few miles from the east coast, and separated by a tunnelled hill from its port **Lyttelton**, situated on one of the inlets of Banks Peninsula. **Dunedin** stands at the head of an inlet further south, in the old province of Otago, and is the port of the principal gold-fields of New Zealand. **Invercargill** is the chief town on Foveaux Strait. Its port for large vessels is **Bluff Harbour**. **Greymouth** and **Westport** are the ports of the New Zealand coalfield on the west side of the South Island.

THE AUSTRALASIAN ISLANDS.

(*Except Tasmania and New Zealand.*)

1. **New Guinea**, which is somewhat larger than Texas, is the largest island in the world, with the exception of Australia. It stretches obliquely from near the equator in the north-west to about the same latitude as Cape York on the mainland of Australia in the south-east. Its western half, as far as the meridian of 141° E., has long been claimed by the Dutch, but till recently its eastern half was independent. Now, however, this portion also has been declared to be under the protection of European powers, and the southern portion of the eastern half has been declared under British, the northern under German protection. The latter is now called **Kaiser Wilhelm**[1] **Land**.

The surface of the island is in many parts mountainous. The whole of the narrow south-eastern extremity (which lies almost entirely within the British protectorate) is traversed by chains of mountains, one peak of which, **Mt. Owen Stanley**, is believed to exceed in height the highest summit in New Zealand. Lying within the monsoon area, the whole island receives copious rains during about half the year (see pp. 42 and 51 (*b*)), and, like other tropical countries with an abundant rainfall, New Guinea is covered with dense forests, which are one of the chief causes why the interior of the island is as yet so little known.

Like Tasmania, which is also separated from Australia by a shallow strait, New Guinea was probably at one time connected with the mainland of Australia by land, and hence has native plants and native animals similar to those of its larger neighbour. The forests of New

[1] *Ger.* = Emperor William.

FIG. 69.—PILE-DWELLINGS AT SAMBOANGAN (PHILIPPINE ISLANDS).

Guinea are haunted by many beautiful and gay-plumaged birds, among which are birds of paradise. The cassowary, a running bird with a brilliantly coloured bony crest on the head, takes the place of the emu of Australia. The resemblance in animal and plant life extends also to the islands to the west of New Guinea as far as a deep strait between the two islands of Bali and Lombok.[1]

The natives are known as **Papuans,** and are a very dark-skinned race with black curly hair, often growing in numerous tufts. They dwell in villages, the houses of which are built on stakes along the margin of the sea-coast or the rivers, and are frequently placed in the water and connected with the shore by a bridge.

[1] This strait forms part of what is known as Wallace's Line, which, as was pointed out by the English naturalist A. R. Wallace, divides two groups of islands, one of which was probably connected at one time with the mainland of Asia, and has plants and animals more nearly allied to those of the Asiatic continent, and the other probably connected with Australia.

Pile-dwellings similar to those inhabited by the Papuans are very widespread. They are in very general use among the Malay races,[1] and have been met with also in New Zealand, in Central Africa, and on the coasts of both North and South America; and remains of similar dwellings belonging to prehistoric times are known in Switzerland, Scotland, and Ireland. The example shown in the cut belongs to the Eastern Archipelago.

Like other uncivilised natives of tropical countries, the Papuans are very indolent. The **food-plants** which they grow are mainly such as require but little cultivation—**bananas, yams, sugar-cane, coco-nuts,** and **taro**;[2] but, in addition to these, tobacco is also grown, and is indeed so highly prized that it is the chief article of barter with the natives.

Mission-stations have now existed for many years at different points of the coast now under the protection of Great Britain, and in the schools belonging to these stations many native children are now educated, many of the teachers being natives of other islands of the Pacific. No plantations belonging to Europeans as yet exist in the British protectorate, or are even allowed, since the land belongs to the natives, and none but natives are at present allowed to acquire it. The residence of the British governor or Special Commissioner of New Guinea is at **Port Moresby,** which lies to the east of the Gulf of Papua, and has regular steam communication with several ports in Queensland. It lies behind a long barrier reef which skirts the whole of this part of the New Guinea coast, access being obtained to it by one of the numerous deep channels by which this reef, like the Great Barrier reef of the neighbouring coast of Australia (see p. 349), is crossed.

2. **Melanesia.**—This name, meaning 'islands of the blacks,' is applied to several groups of small islands to the east and south-east of New Guinea, inhabited by Papuans.

The islands of New Britain,[3] New Ireland,[3] the Admiralty group, and others to the north of the eastern end of New Guinea, are now known

[1] See p. 319.

[2] The *banana* grows everywhere within the tropics, and also five or six degrees beyond them. It begins to bear fruit soon after being planted, and will afterwards go on yielding a hundredweight of fruit year after year without any attention. Many different kinds are cultivated both in the Old World and the New. The *yam* is a climbing plant with tubers or underground stems from twelve to twenty inches in length, and four to six inches in thickness. Like those of the manioc (see p. 174), they are injurious when eaten raw. So also are those of the *taro*, a plant cultivated (in marshy soil) not only for its tubers, but also for the sake of its leaves, which are eaten as vegetables. *Coco-nuts* are the fruit of a tall palm tree, which adorns the coasts in all parts of the tropics, and is the only tree that grows on many of the small islands of the Pacific. The nut when green yields a refreshing drink; when ripe and brown, it contains the white kernel, which is eaten as food, and which, after being dried, is known as *copra*. This article is of great value for its oil, used in making soap and candles.

[3] Now called respectively New Pomerania and New Mecklenburg.

by the name of the **Bismarck Archipelago**, and belong to Germany. These are followed south-eastwards by the **Solomon Islands**,[1] the **New Hebrides** and **New Caledonia**. The last-mentioned island, along with the adjacent group of the **Loyalty Islands** to the east, belongs to the French, who make use of it as a place of deportation for convicts and political offenders. It is skirted all round by a long line of coral reefs, which stretch for a considerable distance to the north-west, enclosing a number of small islands. **Numea** or Noumea, in the south-west of New Caledonia, is the chief town on the island. The New Hebrides are now under the joint protection of the British and French.

POLYNESIA.

This name is applied to all the small islands of the Pacific Ocean, with the exception of those already mentioned. They are mostly coral islands, and hence flat (p. 33, *n.* 1), but some (those generally of greater size) are of volcanic origin and mountainous. They are almost all situated within the tropics, and the chief food of the people is the **bread-fruit**,[2] in addition to those already mentioned as cultivated in New Guinea. The people belong to a race with a clear brown skin and smooth hair, and are a branch of the great Malay stock, to which the Maori also belong. Christianity has been introduced with considerable success on many of the islands.

1. The **Fiji Islands** are a group composed mainly of volcanic islands situated to the north of New Zealand, and mostly lying between the parallels of 16° and 19° S. Their total area is not far from eight thousand square miles, and Viti Levu, the largest of the islands, embraces more than half the land surface belonging to the group. The islands were ceded in 1874 by their native king to Britain, and now form a British Crown colony.[3] Even before that time people of European origin had established plantations of tropical crops on several of the islands, and since that date the products of such plantations (chiefly sugar, but also

[1] Under an agreement concluded between the British and German Governments in 1885, part of the Solomon group is declared to belong to the British, part to the German sphere of influence.

[2] The *bread-fruit* is the fruit of a tree confined to the tropics. The fruit weighs from three to four pounds, and the tree is so productive that two or three trees are said to be capable of supporting a man for a year. As to the other products here mentioned, see p. 365, note.

[3] See p. 195.

coco-nut, maize, tobacco, coffee, and cotton) have increased very greatly, and a large trade has thus grown up.

The plantation labourers are partly natives of the islands themselves; but as these are not enough, labourers from other islands (principally the New Hebrides and the Solomon Islands) are introduced to work for the planters for a period of years, as in Northern Queensland. The introduction of these labourers and their treatment on the plantations are entirely under the control of the Government. The chief towns of the group are seaports with fine harbours protected by coral reefs. The capital is **Suva**, in the south-east of Viti Levu.

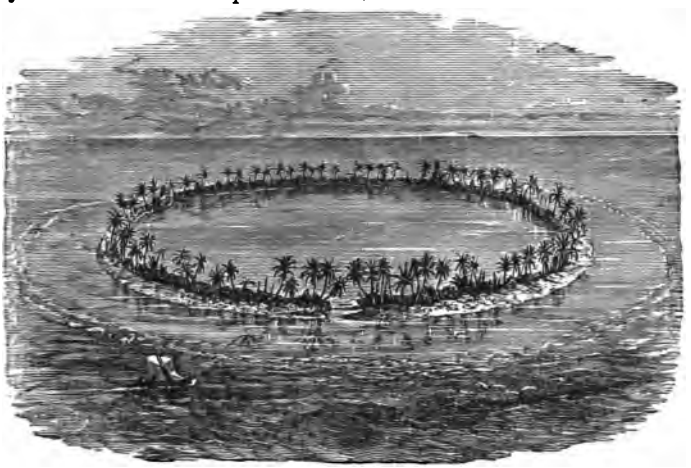


FIG. 70.—AN ATOLL OR RING-SHAPED CORAL ISLAND WITH COCO-NUT PALMS.

The next in importance is **Levuka**, the former capital, on a small island to the east of Viti Levu. The small island of **Rotumah**, to the north of the Fiji group, is now also British, and is annexed to the colony of Fiji. The total population of the group is about 130,000.

2. The **Tonga** and **Samoan**, or **Navigator Islands**, lie to the east of the Fiji group, and still further east are the **Society** and **Low Islands**.

The port of **Apia**, on one of the Samoan Islands, is the centre of the German trade with the Pacific Islands, the chief product of which for European markets is copra.[1] The Society Islands, of which the most important is the charming volcanic island of **Tahiti**, are under French protection, and so also are the Low Islands, and the **Marquesas** group to the north of the latter.

3. Between the equator and 15° N. are the **Pelew**, **Caroline**,

[1] See p. 365 *n.*

and **Marshall Islands**, in that order from west to east, and south of the last-mentioned group the **Gilbert Islands**.

The first two of these groups belong to Spain, which possesses also the **Marianne** or **Ladrone** Islands to the north of the Carolines. The Marshall Islands have been taken possession of by Germany.

4. The **Sandwich** or **Hawaian Islands** are an important group of volcanic islands nearer the coast of North America, between 19° N. and the Tropic of Cancer. In area they are about equal to the Fiji Islands, which they resemble in the nature of their products. Nearly all the sugar exported is sent to San Francisco. Other exports are rice, hides, wool, etc. Commerce centres in Honolulu on the island of Oahu, which has a good harbour and is a port of call for vessels voyaging between San Francisco and Australia.

The chief island is **Hawaii**, on which the extinct volcano of Mauna Kea rises to the height of nearly 14,000 feet. Farther south is the active volcano of Mauna Loa, with the vast so-called crater of Kilauea —a depression about 3½ miles in length by 2½ miles in breadth, formed by the dropping in of the roof of a cavity filled with molten lava. When eruptions take place from this cavity, the lava which is poured forth is remarkable for its very liquid character, flowing almost as readily as water.

The population of the group is under 100,000, less than half of whom are natives. As in the Fiji group, the plantations belong to people of European stock, and the labourers are partly natives, but to a large extent composed of immigrants. Many of these are Chinese, and many Portuguese from the Azores, and recently many Japanese have come to the islands. The government is a republic, the native constitutional monarchy having come to an end in 1893. The capital is **Honolulu**.

ANTARCTIC REGIONS.

Compared with the Arctic regions, those round the Antarctic pole are remarkable for the uniformity of their low temperatures. To the south of 62° S. the mean temperature of both sea and air is at or below the freezing-point of fresh water even in summer. Still nearer the south pole, ice barriers have stopped the advance of explorers at a latitude of about five degrees lower than that attained in the Arctic regions. The highest latitude ever reached in southern seas was 78° 10′ S., the latitude at which the progress

of Sir James Ross was arrested in 1842, after he had sailed along an icy barrier about 400 miles in length, and from 150 to 200 feet in height. He had previously sighted land, the coast of which he traced from the parallel of 72°. To this land, the most extensive that has been seen in the Antarctic regions, he gave the name of **Victoria Land**, and on it he observed in the course of his voyage an active volcano, **Mt. Erebus**, nearly 13,000 feet in height. But though Victoria Land is the most extensive piece of Antarctic land that has actually been seen, the swarms of icebergs in Antarctic seas, and the deposits of terrestrial origin that have been found in the vicinity of the ice barriers of the south, afford the clearest evidence of the existence of an Antarctic continent. In 1887 the Government of the Australian colony of Victoria made a proposal for fitting out an expedition to explore the Antarctic lands south of the latitude reached by Sir James Ross.

AREA AND POPULATION IN ROUND NUMBERS OF THE PRINCIPAL STATES OF EUROPE AND THE MORE POPULOUS COUNTRIES OF OTHER CONTINENTS.

	Area in thousands of square miles	Ratio to Kansas	Population in millions about 1890	Population about 1890 per square mile	Population in millions about 1880	Population about 1880 per square mile
Australian Colonies. See p. 354						
Austrian Empire	242	2¾	41	171	38	157
Belgium	11·4	⅛	6	540	5·5	487
Brazil	3,200	36	14	4	12	4
Canadian Dominion	3,470	39	4·8	1·5	4·3	1·3
China (proper)	1,550	17	380	245	—	—
Denmark	15·4[1]	⅙	2·1	143	2	128
Egypt	10·7[2]	⅛	6·8	638	6·8	530
France	206	2⅓	38	188	38	185
German Empire	209	2⅓	49	236	45	217
Bavaria	29	⅓	5·5	190	5·3	180
Prussia	134	1½	30	223	27	200
Saxony	5·8	1/16	3·5	604	3·0	515
Würtemberg	7·5	1/12	2	270	2·0	260
Greece	25	⅓	2·1	87	2	80
India[3]	1,587	18	287	186	260	164
British India	944	10¾	220	234	198	210
Italy	111	1¼	30	263	28·5	257
Japan	150	1⅔	40	271	37	247
Mexico	750	8½	11·2	15	10	13
Netherlands[4]	12 5	⅛	4·5	360	4	315
Norway	126	1⅓	2	16	1·9	16
Portugal	34	⅓	—	—	4·1	120
Roumania	51	⅝	—	—	5·4	106
Russia[5]	2,095	23	96	45	85	41
Servia	19	⅕	2	114	1·8	97
Spain	196	2⅛	17·5	88	17	88
Sweden	174	2	4·7	27	4·6	26
Switzerland	16	⅙	2·9	183	2·8	177
Turkey in Europe	61	⅔	4·8	78	4·5	70
Bulgaria[6]	37·8	⅜	3	83	2·8	74
United Kingdom	121	1⅓	38	313	35	290
United States[7]	3,025	36	62	21	50	17

[1] Exclusive of Iceland, but inclusive of Faroe Islands. [2] Exclusive of desert.
[3] Exclusive of Burma and of Nepal and Bhutan. See p. 313.
[4] Exclusive of Luxemburg. [5] Including Finland.
[6] Including Eastern Roumelia. [7] Exclusive of Alaska.

INDEX.

CONTRACTIONS.

Af. Africa.
Alg. Algiers.
A. R. Argentine Republic.
Arch. Archipelago
Aust. Austria.
Brit. British.
Braz. Brazil.
Br. Col. British Columbia.
C. Cape.
Cent. Am. Central America.
Ch. China.
Co. County.
Col. Colony.
d. duchy.
des. desert.
dist. district.
div. division.
Dom. Dominion.
Du. Dutch.
emp. empire.
est. estuary.
For. Forest. [sions.
For. Pos. Foreign Posses-
Fr. French.
Hg.-Kg. Hong-Kong.
I. Island.
I.-C. Indo-China
Ind. India.
Is. Islands.
isth. isthmus.
Jam. Jamaica.
kgd. kingdom.
L. Lake.
lang. language.
Mesop. Mesopotamia.
Mor. Morocco.
Mts. Mountains.
N. A. North America.
Nn. Northern.
N. S. Nova Scotia.
N.S.W. New South Wales.
N. Zd. New Zealand.
Ont. Ontario.
P. Pass.
penin. peninsula.
plat. plateau.
pt. point.
pop. population.
pr. prov. province.
Pres. Presidency.
Prus. Prussia.
Qd. Queensland.
R. River.
rep. republic.
Rus. Russia.
S. South.
Sc. Scotland.
Sp. Spain.
st. state.
Str. Strait.
Syr. Syria.
Tas. Tasmania.
tn. town.
U. S. United States.
Vic. Victoria.
W. A. West Australia.
W. I. West Indies.

AACHEN, **222**.
Aar, R.. **235**, 238.
Abana, R., 299.
Aberdeen, **204**.
Abruzzi, **269**, 275.
Abyssinia, 332, **345**.
Acadia, 82, **87**.
Acapulco Harbor, 69 *n*.
Acapulco, **166**.
Aconcagua, **170**.
Adda, R., 272.
Adelaide, **347**, **355**, **358**.
Aden, 195, **303**, **313**.
Aden, Gulf of, **345**.
Adige, R., **183**, 245, 271.
Adirondacks, Mts., **108**, 111.
Admiralty Is., 365.
Adour, R., 211.
Adria, **271**.
Adrianople, 277, **282**.
Adriatic Sea, 235, 239, 271, 277.
Ægean Sea, 278, 280, 284.
Ægina, Gulf of, **283**.
Æmilian Road, **269**, 272.
Afghanistan, **304**.
Africa, **331–346**.
Africa, Br. S., **341**.
Africa, S., 347, 349, 350.
Agra, **314**.
Agram, **247**.
Agulhas, C., 331.
Ahmedabad, **315**.
Aix-la-Chapelle, 222, *n*. 3.
Ajaccio, **213**.
Ajmir, **313**.
Akabah, Gulf of, **302**.
Akron, 129.
Alabama, 112, 128, 129, 137, 141, 157.
Alabama basin, 120.
Alabama R., **115**.
Alabama system, **114**, 115.
Alashehr, **299**.
Alaska, 72, 75, 78, 82, 93, 98 *n*. 1, 105, 137, 138, 142, **161**, **162**.
Albania, 260, **262**, 264.
Albanians, **260**.
Albany, U.S., 140, **148**.
Albany, W.A., **358**.
Albemarle canal, 156.
Albemarle Sound, 69 *n*., **95**.
Alberta, **92**.
Albert Nyanza, L., 332 *n*. 1.
Albuquerque, 73 *n*. 5.
Albury, **356**.
Aleppo, **299**, 300.
Aletsch Glacier, **231**.
Aleutian Archipelago, 161.
Aleutian Is., 161.
Alexandretta, **299**.
Alexandria, 2;6, **336**.
Algeciras, Bay of, 266.
Algeria, 285, **337**
Algiers, **338**.
Algoa Bay, **343**.
Alicante, 266.
Allahabad, **314**.
Alleghanies, Great Valley, 107
Alleghany, 129, **150**.
Alleghany Mts., **110**.
Alleghany Plateau, 110 *n*. 1 111.
Alleghany, R., 109, 117.
Allier, R., 205.
Alligator Swamp, **112**.
Almaden, 126 *n*. 2.
Almaden, New, 126.
Almeria, **266**.
Alps, Bernese, 231.
Alps, Limestone, **231**.
Alps, Maritime, 231.
Alps, Passes across, **233**, **234**.
Alps, The, 67, 75, **183**, **205**, **229**, 234, **229**, 269.
Alps of Valais, 231.
Alpine tunnels, 234.
Alsace-Lorraine, **224**, 225, 228.
Altai Mts., **291**, **292**.
Altona, **226**.
Altoona, **150**.
Amadeus, L., **351**.
Amager, Is., 261.
Amazon, R., 70, **170**, **171**, 176, 177.
America, **64–68**.
America, Brit., 81, **84–92**.
America, Central, **64**, 68, 72, 78, 80, 81, 82, 135, **166**.
America, Middle, 64, 135.
America, North, 66, **68–168**.
America, Sp. North, 81.
America, South, 65, 68, 70, 78, 80, **168–180**.
Amritsar, 310, **315**.
Amsterdam, **219**.
Amu. R., 294, 328.
Amur, R, **291**.
Anahuac, plat., **164**, 165.
Anam, 285, **318**
Anamese, 290.
Ancona, **275**.
Andalusia, **266**, 267.
Andaman Is., **313**.
Andes, 93 *n*. 2, **170**, **171**.
Andorra, **266**.
Androscoggin Falls, 144.
Angara, R,. 293.
Angers, **211**.
Angkor Wat, 318.

Anglesey, 196.
Angora, 297.
Angra Pequena, 341.
Anhalt, 225 *n.* 1.
Anjou, 211.
Ann Arbor, 153.
Annapolis, 138, 141, 156.
Annapolis, Valley of, 87.
Annobon, 285, 346.
Antananarivo, 346.
Antarctic Circle, 20.
Antarctic Ocean, 24, 55.
Antarctic Regions, 369.
Anti-cyclone, 41.
Anti-Lebanon, 298, 299.
Antilles, 69, 166, 167, 168 *n.* 2.
Antioch, 299.
Anti-Taurus, 297.
Anti-trades, 40, 41.
Antwerp, 199.
Aosta, 233.
Apennines, 229.
Apia, 367.
Appalachian Highland, 106, 107.
Appalachian Mts., 71, 97, 106–109, 126, 128, 131.
Appalachian Plateau, 110.
Appalachian system, 107, 108.
Apuan Hills, 270.
Apulia, 269, 275.
Aquitania, 211 *n.* 3.
Arabia, 285, 286, 302.
Arabs, 270, 319, 334.
Aracan, 317.
Aragon, 263, 268.
Aral, Sea of, 289, 294.
Ararat, Mt., 296.
Aras, R., 295, 296.
Araucanians, 177.
Arawaks, 167.
Arcadia, 278.
Archangel, 250, 254.
Arctic Arch., 65, 84.
Arctic Circle, 20.
Arctic Ocean, 24, 55.
Arelate, 212.
Argentine Rep., 135, 171, 178.
Argolis, 279.
Argonnes, For. of, 207.
Argos, 274.
Arizona, 66 *n.* 4, 73, 77.
Arizona des., 164.
Arizona Ter., 142.
Arkansas, 111, 130.
Arkansas R., 100, 141.
Arles, 212.
Armenia, 294–296.
Armenians, 281, 296.
Arno, R., 269, 273.
Artesian Wells, 338, 358.
Artois, 30.
Aruba, 168.
Aryan languages, 290.
Aryans, 304, 311.
Ascension, 346.
Ashanti, 340.
Asia Minor, 285, 297.
Aspinwall, 178.
Assab, 285, 345.
Assam, 309, 313.
Assiniboia, 92.
Assiniboine, R., 90.
Astrakhan, 249, 250, 254.
Asturias, 263, 267.
Atchafalaya, The, 112.
Atbara, R., 336.
Atchison, 154.
Athabasca, dist., 92.
Athabasca, R., 96.
Athens, 283.
Atlanta, 140 *n.* 1, 141, 157.
Atlantic City, 149.
Atlantic Ocean, 89, 44, 46, 49, 56, 64, 67, 71, 95.
Atlantic slope, 106, 107, 112.
Atlantic States, 143.
Atlantic system, 114, 115.
Atlas, Great, 337.
Atlas, Little, 337.
Atlas Mts., 331, 339.
Atmosphere, 38.
Atolls, 33 *n.*
Attica, 283.
Attoo *or* Attu I., 68, 161.
Auburn, 148.
Auckland Is., 360.
Auckland, N. Zd., 362, 363.
Augsburg, 225.
Augusta, Ga., 113.
Augusta, Me., 114, 140, 144, 156.
Aurora, 152.
Austin, Texas, 75 *n.* 2, 141, 158.
Australia, 42, 48, 51, 52, 60, 64, 93 *n.* 3, 129, 130, 134, 347–359.
Australian Alps, 349, 355.
Australasian Colonies, The, 354, 355–362.
Australians, 353.
Austria, 224, 229.
Austria-Hungary, 239–247.
Austria, Lower, prov., 234, 239, 244.
Austria, Upper, prov., 239, 244.
Austrian Empire, 370.
Auvergne, 206, 212, 221.
Avignon, 212.
Avon, R., Lower, 203.
Avon, R., Upper, 203.
Azof, Sea of, 181.
Azores, 285, 345.
Aztecs, 165, 177.

Bab-el-Mandeb, Str. of, 42, 303.
Babylon, 25, 59, 301.
Bad Land Cliffs, 103 *n.* 3.
Bad Lands, 106.
Baden, Grand Duchy, 224, 225.
Baffin's Bay, 84.
Bagdad, 301.
Bahamas, 69, 166, 167, 168.
Bahia, 174.
Bahr-el-Abiad, 332 *n.* 2.
Bahr-el-Asrek, 332.
Baikal, L., 288, 292.
Baker City, 159.
Baku, 295.
Balaton, L., 241.
Bâle, 220 *n.* 2.
Balearic Is., 269.
Bali, 287, 364.
Balkan Mts., 279.
Balkan Peninsula, 182, 262, 277–284, 286, 287.
Balkhash Lake, 289, 294.
Ballarat, 356.
Baltic Sea, 43, 48, 182, 258.
Baltic, Tides of, 45.
Baltimore, 95, 113, 133, 135, 136, 155, 156.
Baluchistan, 304.
Banat, 240.
Banca, 321.
Bangalore, 315.
Bangkok, 317.
Bangweolo, L., 332.
Bangor, U.S., 114, 144.
Bar (*of a river*), 27.
Barada, R., 299.
Barbados, 168.
Barcelona, 266.
Barcoo, R., 351.
Bardez, 285.
Barka, 337.
Barmen, 222.
Baroda, st., 312.
Basel, 221, 238.
Basin (*of a river*), 26.
Basque Provs., 263.
Basques, 211.
Basra, 301.
Bass Strait, 359.
Bastia, 213.
Basuto Land, 194, 343.
Batavia, 321.
Bath, 203.
Bathurst, 356.
Baton Rouge, 112, 118, 141, 158.
Batum, 295.
Bavaria, 220, 224, 225, 228, 245, 270.
Bay City, 153.
Bayonne, 211.
Bayous, 112.
Bear, R., 102.
Bechuana Land, 194, 341, 343.
Behring's Strait, 24, 48.
Beirut, 298.
Belfast Lough, 205.
Belfast, 205.
Belgium, 135, 216 *n.* 4, 213–219, 224, 270.
Belgrade, 283.
Belize, 83, 166.
Belt, Great, 260.
Belt, Little, 260.
Benares, 314.
Bengal, 306, 310, 311, 313.
Bengal, Bay of, 42, 307.
Ben Nevis, 198.
Benue R., Lower, 195.
Berar, 313, 315.
Berbera, 345.
Berbers, 334, 337, 338.
Bergen, 259.
Bering Sea, 162.
Bering Strait, 64.
Berkeley, 161.
Berlin, 225, 227.
Bermudas, 92.
Bern, 229, 238.
Besançon, 212.
Bessarabia, 255.
Bethlehem, 299.
Beypur, 307.
Bhamo, 317.
Bhutan, 312, 316.
Bias, R., 314.
Biddeford, 144.
Bienne, L., 31 *n.* 5, 237.
Big Horn Range, 99.
Bilbao, 267.
Biled-ul-Jerid, 338.
Bingen, 221.
Binghamton, 149.
Birmingham, 62, 203.
Birmingham, Ala., 129, 157.
Biscay, prov., 267.
Bismarck Arch., 366.
Bismark, 73 *n.*, 140, 154.
Bitter Root Range, 98.
Black Cañon, 103.
Black Dome, Mt., 62, 97, 109.
Black Earth, Rus., 251, 255.
Black Forest, 220, 229.

Black Hills, 106, 128, 132, 154.
Black R., 109, 149.
Black River Canal, 109.
Black Sea, 42, 48, 182, 235, 248, 271, 281, 295.
Blackstone, R., 145.
Blanc, Mt., 229, 231.
Blanca Peak, 100 n 2.
Blanco, C., 331.
Bloomington, 152.
Blue Mts., Oregon, 101.
Blue Mts., N.S.W., 356.
Blue Ridge, 109.
Bluff Harbour, 363.
Bluffs, 111, 112.
Bochetta Pass, 273.
Bodensee, 235.
Boers, 344.
Bogong, Mt., 355.
Bogota, 175.
Bohemia, 209, 224, 239, 240, 243, 244.
Bohemian Forest, 220.
Böhmerwald, 220 n. 4.
Boise City, 72 n. 7, 142, 159.
Bolan P., 305.
Bolivia, 177.
Bolivian basin, 120.
Bologna, 269, 273.
Bolsena, L., 270.
Bombay, 314, 315.
Bombay, Pres., 311, 313, 315.
Bonaire, 168.
Bonn, 223.
Bora, The, 246.
Bordeaux, 211, 249.
Borneo, 287, 318, 321.
Borneo, N., 195.
Bornholm, I., 260.
Bornu, 337.
Boro Buddor, 319 n.
Bosnia, 243 n., 278, 280, 281, 286.
Bosporus, 48, 182, 281.
Boston, U.S., 93, 96, 131, 132, 133, 135, 136, 139, 140, 145.
Boston Harbor, 96.
Bothnia Felix, 71.
Bothnia, Gulf of, 186, 248.
Bottom land, 112.
Boulogne, 209.
Bourbon, 285, 346.
Brabant, S., 219.
Bracciano, L., 270.
Bradford, U.S., 130.
Bradford (York.), 203.
Brahmanism, 290.
Brahmaputra, R., 288, 307, 328.
Brandenburg, prov., 227.
Brasilia, 67.
Braunschweig, 228 n. 5.
Brazil, 68, 93 n. 3, 135, 172–174, 370.
Brazil, mountain land of, 70, 170.
Brazil, Ind., 130, 151.
Brazos, R., 115.
Bremen, 61, 201, 225.
Bremerhaven, 61, 225.
Brenner Pass, 228, 234, 239, 246, 272 n. 2, 273.
Brenta, R., 271.
Breslau, 222, 237.
Brest, 210.
Bridgeport, U.S., 145.
Brieg, 62.
Briens, L., 237, 239.
Brighton, 201.
Brindisi, 276.
Brindisi, Australian, 355.
Brisbane, 355, 357.
Brisbane, R., 357.
Bristol, 190, 202.
Bristol Channel, 45, 202.
British India, 194, 370.
British Isles, 45, 55, 194.
Brittany, 207, 208, 210, 246 n. 4, 283 n. 4.
Brooklyn, 132, 146, 149.
Brown Cliffs, 103, n. 3.
Bruges, 217, 218.
Brundusium, 276.
Brunei, 321.
Brünn, 245.
Brunswick, d., 225, n. 1.
Brunswick, tn. and d., 228.
Brussa, 286.
Brussels, 219.
Buda-Pest, 61, 247.
Buddhism, 290, 291.
Buen Aire, 166.
Buenos Ayres, pr., 178.
Buenos Ayres, tn., 168, 178.
Buffalo, 116, 124, 130, 134, 148, 152, 153.
Bug, R., 249, 254.
Bukarest, 61, 256.
Bukhara, 294.
Bukovina, 241, 247, 253, n. 1, 255.
Bulgaria, 279, 280, 283, 370.
Burdigala, 211.
Burgundian Plain, 224
Burgundian Plateau, 207.
Burgundy, 208.
Burgundy Canal, 206.
Burlington, 146, 154.
Burma, 313, 317.
Burra Burra, 358.
Burrard Inlet, 92.
Bushire, 305.
Bushmen, 343.
Bussora, 301.
Butte City, 128, 159.
Buzzard's Bay, 96, 145.
Byzantium, 282.

Cacao, 174.
Cadiz, 207.
Cagliari, 276.
Cairo, 336.
Cairo, U.S., 152.
Calabria, 275.
Calais, 209.
Calcutta, 313, 314.
Calgary, 92.
Calicut, 315.
California, 47, 72, 77, 81, 97 n. 2, 101, 121, 122, 123, 124, 126, 129, 131, 137, 142, 159, 160.
California, Gulf, 69 n.
California Valley, 104.
Callao, 176.
Cambay, Gulf of, 307.
Cambodia, 285, 318, 319.
Cambridge, U.S., 145.
Camden, 149.
Cameroon Mts., 339.
Campagna, 275.
Campania, 269, 275.
Campos, 171.
Canada, Dom. of, 80, 81, 83, 84–92, 107, 129, 135, 370.
Canada, forests of, 78.
Canada, French, 87.
Canal du Centre, 206.
Canal du Midi, 213.
Canary Is., 285, 345.
Candia, I., 282.
Candia, town, 283.
Canebrake Cañon, 103 n. 4.
Cannes, 213.
Cañon of Lodore, 103 n. 2.
Cañons, 101, 102, 103.
Cantabrian Mts., 263.
Canterbury Plains, 361, 363.
Canton, 226, 227.
Canton, R., 227.
Cape Barrow, 68.
Cape Breton, 87.
Cape Charles, 68.
Cape Coast Castle, 239, 240.
Cape Cod, 69, 96.
Cape Cod Bay, 96.
Cape Cod Peninsula, 113.
Cape Colony, 194, 341.
Cape Farewell, 68.
Cape Gallinas, 68.
Cape Mendocino, 68.
Cape Prince of Wales, 68.
Cape Sable, 68.
Cape St. Roque, 68.
Cape Town, 343.
Cape Verde Is., 285.
Capua, 276.
Caraccas, 168, 175.
Cardamom Mts., 307.
Cardiff, 202.
Caribbean Sea, 69, 72, 170.
Caribs, 167.
Carical, 285.
Carmel, Mt., 298.
Carniola, 246.
Carnuntum, 244.
Carolina, North, 97 n. 1, 113, 141.
Carolina, South, 112, 113, 124, 137, 141.
Caroline Is., 366.
Carpathian Mts., 183, 240, 279.
Carpentaria, Gulf of, 347.
Carrara, 270.
Carson City, 142.
Cartagena, 176.
Carthago Nova, 26 n. 3.
Cascades, the, 120.
Cascade Mts., 70, 72, 94, 96, 101, 104.
Casco Bay, 96, 144.
Casiquiare, 27 n. 1.
Caspian Sea, 181, 184, 248, 249, 288, 295.
Castile, Old and New, 263, 267.
Catalaunian Plain, 212.
Catalonia, 265.
Catania, 276.
Cataract Cañon, 103 n. 4.
Catskill, 148.
Catskills, Mts., 108, 110.
Cauca, R., 170.
Cauca Valley, 175.
Caucasia, 294.
Caucasian type, 289, 290.
Caucasus, Lieutcy., 285, 296.
Caucasus Mts., 35, 295, 304.
Cawnpore, 314.
Cayenne, 174.
Cayuga Canal, 109.
Cayuga, L., 110, 149.
Cedar Rapids, 154.
Celebes, 319, 321.
Cenis, Mt., pass, 233.
Cenis, Mt., tunnel, 272.
Central India Agencies, 312.
Central Provs., Ind., 313.

Central States, 143.
Cerigo, 283.
Cerro de Pasco, 176.
Cetinye, 283.
Ceuta, 285.
Cevennes Mts., 205.
Ceylon, 194, 316.
Chad, L., 333, 337.
Châlons-sur-Marne, 212.
Châlon-sur-Saône, 212.
Chamounix, 229.
Champagne, 208, 212.
Champlain Canal, 109, 148.
Champlain, L., 107, 108, 109, 114, 146.
Chandernagor, 285.
Charente, R., 211.
Charles, R., 88.
Charleston, 124, 133, 136, 141, 156.
Charleston Harbor, 95.
Charlottetown, 88.
Charters Towers, 357.
Chatham Is., 360.
Chattanooga, 157.
Chelsea, U.S., 145.
Chemung Canal, 109
Chemnitz, 222.
Chenango Canal, 109, 149.
Cherbourg, 210
Chernagora, 278 *n.* 2.
Chesapeake Bay, 80, 95, 115, 156.
Chesapeake Canal, 109, 113, 133.
Chester, 202.
Chester, U.S., 150.
Cheviot Hills, 196.
Cheyenne, 133, 142.
Chicago, 61, 122, 123, 125, 131, 132, 133, 134, 136, 151, 152, 153, 155, 158.
Chihuahua, R., 95.
Chile, 177–178.
Chiloe, I., 69, 171.
China, 42, 129, 135, 286, 306, 321–327, 370.
China Sea, 42.
Chinese Sea, E., 287.
Christchurch, 363.
Christiania, 186, 259.
Christianity, 290
Cilician Gates, 297.
Cincinnati, 131, 132, 151, 157.
Cis-Caucasia, 296.
Cis-Leithan crownlands, 243.
Clark Fork, 98.
Clermont, 206.
Cleveland, U.S., 130, 150, 151, 152.
Clutha, R., 361.
Clyde, Firth of, 196.
Clyde, R., 203.
Coast Range, 98, 104, 105.
Cochin-China, Fr., 285, 318.
Cohoes, 148.
Coimbra, 285.
Col di Tenda, 62, 233.
Cold Wall, 47
Cologne, 222.
Colombia, 175, 176
Colombo, 316.
Colon, 72 *n*, 176.
Colonia Agrippina, 222.
Colorado basin, 100, 103, 120.
Colorado des., 95, 102, 120.
Colorado Parks, 100.
Colorado plateau, 102, 103.
Colorado, R., 71, 73, 95, 100, 102, 103, 115.
Colorado Springs, 159.
Colorado, st., 103, 126, 130, 142, 159.
Colorado system, 114.
Columbia, 113, 141, 156.
Columbia, Brit., 72, 90, 92.
Columbia, Dist. of, 11, 137, 138, 141, 156.
Columbia plateau, 101.
Columbia, R., 71, 73, 80, 94, 100, 101, 104, 162.
Columbia system, 114, 118.
Columbus, 140, 151, 157.
Comacchio, Val di, 270
Comino, 277
Como, L., 233, 269.
Comorin, C., 306, 307
Comoro Is, 285, 346
Concord, N.H., 140, 144
Congo Free State, 340.
Congo, R., 332, 339.
Connaught, 204.
Connecticut, 81 *n.* 4, 125, 131, 140, 145, 146.
Constance, L, 220, 235, 287.
Constantine, 338.
Constantinople, 280, 281.
Constantinople, Str. of, 281.
Continents, area and pop., 62.
Cook Inlet, 162.
Cook, Mt., 360.
Cook, Str., 360, 362.
Coolies, 313.
Cooper's Creek, 351.
Coorg, 313.
Copenhagen, 261.
Copts, 335.
Coral, 33 *n.*
Coral reefs, 349.
Corcyra, 283.
Cordilleran or Western states, 143, 144, 159–162.
Cordilleras, 70, 98, 170.
Cordoba, pr. and tn., A.R., 178.
Cordoba, Sp., 266.
Cordova, 72 *n.*
Corfu I, 283.
Corfu, tn., 284.
Corinth, isth., gulf., and town, 283
Cork, 205.
Coromandel Ct., 315
Corsica, 213.
Costa Rica, 82, 83, 166.
Côte d Or, 207
Council Bluffs, 154.
Covington, 151, 157.
Cracow, 247.
Cremona, 272.
Creoles, 165.
Crete, 280, 282.
Creuzot, 208
Crimea, 254
Croatia, 246, 247.
Cronstadt, 254.
Ctesiphon, 301
Cuba, 68, 69, 124, 135, 166, 168
Cumberland, U S., 156.
Cumberland Mts., U S., 110.
Cumberland plateau, 110.
Cumberland, R., 117, 129.
Cumberland Valley, U.S., 107.
Cunene, R., 341.
Curaçao, 168.
Currents, Ocean, 45–48.
Cutch, 315
Cuxhaven, 226
Cuzco, 177
Cyclades, 283.
Cyclone, 41.
Cyprus, 195.
Cyrenaica, 337.
Cyrene, 337.
Czernowitz, 247.

Dacca, 311.
Dahomey, 340.
Dakota, North, 97, 140.
Dakota, South, 126, 128, 140.
Dalarne, 259.
Dalles, the, 120.
Dalmatia, 239, 246, 281.
Daman, 285.
Damascus, 299.
Dannemora, 259
Danube, R., 183, 240, 241, 255, 277, 279, 280.
Danzig, 226.
Dardanelles, 182, 286.
Dar-for, 336.
Dariel, Gorge of, 295.
Darjiling, 309.
Darling, R., 350, 351.
Darling Downs, 357.
Davenport, 154.
Davis Strait, 47.
Dayton, 151.
Dead Sea, 299.
Deadwood, 132, 154.
Death Valley, 102.
Debreczin, 247.
Dee R. (Sc.), 204.
Delagoa Bay, 285, 344.
Delaware Bay, 95, 115.
Delaware Canal, 109.
Delaware, R., 109, 115, 133, 149.
Delaware, st., 113, 124, 133, 141.
Delaware Water Gap, 109.
Delgado, C., 265, 344.
Delhi, 314.
Delos, 283 *n.* 2.
Demerara, R., 174.
Denmark, 82, 260, 261, 370.
Denmark, For. Poss., 168.
Denver, 73 *n.*, 103, 133, 142, 159.
Derwent, R., Tas., 359.
Derwent Water, 199.
Des Moines, 140, 154.
Desolation Cañon, 103 *n.* 4.
Detroit, 152, 153.
Devonport, 202.
Diamantina, R., 351.
Dieppe, 209.
Dijon, 212.
Dinaric Alps, 239, 278.
Diu, 285.
Dividing Range, 349, 350, 355, 356.
Dnieper, R., 183, 249.
Dniester, R., 241, 249, 254.
Dobruja, The, 255.
Dodona, 282.
Dominica, 168.
Don, R., Rus., 183, 249.
Donetz, R., 252.
Dora Baltea, R., 233.
Dora Riparia, R., 233.
Dordogne, R., 211.
Dorpat, 255.
Dortmund, 222.
Doubs, R., 212.
Douro, R., 263.

Dover, U.S., 141.
Dover, Str. of, 189.
Dover, tn., 201.
Drakenberg Mts., 331, 343.
Drau, R., 240.
Drave, R., 231, 240, 241.
Dravida (race), 312.
Dresden, 227.
Drift-ice, 57.
Drin, R., 278.
Dublin, 205.
Dubuque, 154.
Duluth, 123, 152.
Dundee, 204.
Dunedin, 363.
Durance, R., 231.
Durban, 343.
Dwina, N., 183.
Dwina, W., 183.

Earth, Area of land and water surface, 24.
Earthquakes, 34.
Earth-tremors, 35.
East River, 96.
East Saginaw, 153.
East St. Louis, 152.
Eastern Archipelago, 35, 42, 61, 166, 303, 318.
Eastern Peninsula, 316 *n.*
Eastport, Me., 93.
Ebro, R., 209.
Echuca, 356.
Ecliptic, 19.
Ecuador, 176.
Eden, R., 196.
Edinburgh, 203.
Edmonton, 92.
Egmont, Mt., 360.
Egypt, 285, 303, 335–339, 370.
Eider Canal, 226.
Eifel, 221.
Eisenach, 229.
Eisleben, 229.
Ekaterinburg, 243, 293.
El Jezireh, 301.
El Paso, 159, 165.
Elba, 270.
Elbe, R., 201, 224, 227, 240.
Elberfeld, 223.
Elbrus, Mt., 295.
Elburz Mts., 304.
Elche, 266.
Elefante, 315.
Elgin, U.S., 152.
Elizabeth, 149.
Elmira, U.S., 149.
Elsass-Lothringen, 224 *n.*
England, 82, 135, 189–203.
English Channel, 189.
Enns, R., 231.
Entre Rios, 178.
Epernay, 213.
Ephesus, 296.
Epirus, 282.
Equator, 17.
Equinoxes, 20.
Erebus, Mt., 368.
Erfurt, 229.
Erie, 150.
Erie Canal, 109, 114, 116, 133, 146, 148, 151.
Erie, L., 84, 86, 90, 109, 110, 115, 116.
Erivan, 296.
Er Rif, 339.
Erzberg, 245, 259 *n.* 1
Erzerum, 296.
Erzgebirge, 220, 222, 228.
Escaut, R., 215.
Essen, 222.
Essex Canal, 109, 133.
Estremadura, 263, 267.
Etna, Mt., 266.
Etsch, R., 233, 245.
Euboea, 283.
Eugene City, 161.
Euphrates, 299, 301.
Eurasia, 24 *n.* 1.
Europe, 41, 47, 93 *n.* 3, 181–235.
Eurotas, R., 284.
Evansville, 151.
Evaporation, 49.
Everest, Mt., 287.
Everglades, The, 112.
Eyre, L., 351, 358.

Falkland Is., 180.
Fall River, 96, 145.
Faroe Is, 182.
Faucilles, Mts., 207.
Fen Country, 199.
Fernando Po, 285, 346.
Ferrol, 207.
Fez, 339.
Fezzan, 337.
Fichtelgebirge, 220.
Fiji Is., 195, 354, 367.
Fingal's Cave, 196.
Finke, R., 358.
Finland, 250, 254, 288.
Finland, Gulf of, 248.
Finno-Tatars, 290.
Finns, 253, 257.
Fiords, 257.
Firn, 53 *n.*
Fitzroy, R., Qd., 357, 358.
Fiume, 239, 246.
Flaming Gorge, 103 *n.* 2.
Flanders, 218.
Flinders Range, 357.
Florence, 273.
Florida, 68, 69, 77, 82, 112, 124, 126, 137, 141, 157.
Florida, Str., 69.
Formosa, 324 *n.* 1.
Fort Benton, 117.
Fort Colville, 72 *n.*
Fort Kearney, 75 *n.*
Fort Miller, 94 *n.* 2.
Fort Mohave, 73 *n.*
Fort Selkirk, 162.
Fort Wayne, 151.
Forth, Firth of, 196, 203.
Foveaux Str., 360, 363.
Foyle, Lough, 205.
France, 82, 134, 135, 168, 205–213, 358, 370.
France, For. Poss., 235.
Franche Comté, 212.
Franconia, 228.
Franconian For., 220.
Frankenwald, 220 *n.* 2.
Frankfort, U.S., 141, 157.
Frankfurt, 228.
Franks, 209.
Franzensbad, 245.
Fraser basin, 73.
Fraser, R., 71, 80, 92.
Fredericton, 93.
Frederiksborg, 261.
Fremantle, 359.
Frisches Haff, 226.
Frisian Is., 225.
Front Range, 100.
Fuca, strait, 94, 96, 104.
Fujisan, 329 *n.* 6.
Fujiyama, 329 *n.* 6.
Fulbeh, 337.
Funchal, 345.
Fundy Bay, 45, 88.
Funen, I., 260 *n.* 1.
Fu-niu-shan Mts., 323.
Furca Pass, 235.
Further India, 316 *n.*
Fusinoyama, 329.
Fusiyama, 329 *n.* 6.
Fyen, I., 260, 261.

Gaboon, R., 285, 339.
Gairdner, L., 351.
Galapagos Is., 176.
Galata, 281.
Galats, 256.
Galdhöppigen, 256.
Galicia, Aust., 241, 247, 253 *n.* 1, 255.
Galicia, Sp., 207.
Galilee, L. of, 299.
Gallatin Forks, 117.
Gallipoli, 282.
Galveston, 115, 124 158.
Gambia, 285
Ganges, R., 306.
Garda, L., 269.
Gargano, 269.
Garonne, R., 208
Gascony, 211.
Gauchos, 178.
Gaurisankar, 287 *n.* 3.
Gaya, 314.
Geelong, 356.
Geestemünde, 225.
Gellivara, 257 *n.* 3.
Genesee Falls, 148.
Genesee, R., 110, 133.
Genesee Valley Canal, 109.
Geneva, 238.
Geneva, L., 235, 237.
Genoa, 217, 271, 273.
George, L., 106.
Georgetown, U.S., 113 *n.* 2.
Georgetown, Dem., 174.
Georgia, 97 *n.* 1, 112, 113, 124, 125, 129, 137, 141, 156.
Georgia, Gulf, 69 *n.*
Georgia, S., Is., 195.
German Empire, States of, 224.
German Ocean, 186, 235.
Germantown, 135.
Germany, 134, 135, 192, 220–239, 370.
Germany, For. Pos., 174, 285.
Geysers, 36, 99.
Ghats, Eastern, 307.
Ghats, Western, 307.
Ghent, 217, 218.
Ghor, The, 298, 299.
Gibraltar, 266.
Gibraltar, Str., 182, 183.
Gila basin, 95.
Gila depression, 100.
Gila, des., 103.
Gila R., 102.
Gila valley, 82.
Gilbert Is., 363.
Gippsland, 355.
Gironde, The, 211.
Glaciers, 53, 72.
Glasgow, 190, 203.
Glen More, 196.
Gloucester, U.S., 145.
Goa, 285.
Gobi, des., 289.
Godávari, R., 307.
Goderich, 153.
Gokcha, L., 295.
Golconda, 315.
Gold Coast, 339.
Golden Gate, 94.
Golden Horn, 281 *n.* 3.
Göta-elf, R., 259.
Göteborg, 259.
Gotha, 229.
Gothenburg, 259.
Goths, 209, 264.
Gottland, 258, 259.
Gozo, 195, 277.
Grahamstown, 342.
Grampians, Sc., 196.
Grampians, Vic., 355.
Granada, 262, 266.
Gran Chaco, 171.
Grand Canal, Ch., 326.

Grand Cañon, 102.
Grand Rapids, 153.
Grand R., 100, 103, 153.
Gray's Peak, 100 n. 2.
Graz, 245.
Great American Des., 103 n. 1.
Great Appalachian Valley, 107, 108.
Great Australian Bight, 347.
Great Barrier Reef, 349, 365.
Great Basin, 101, 103.
Great Basin, rivers of, 120.
Great Britain, 129, 134, 135, 168.
Great Britain, For. Poss., 168.
Great Dismal Swamp, 112.
Great Fish River, 86.
Great Lakes, 84, 85, 107, 115, 116, 134, 148, 150, 152.
Great Miami, The, 151.
Great Plains, 96, 106.
Great Salt Lake, 101, 102.
Great Salt Lake Desert, 101.
Great Wall of China, 226.
Greece, 280, 283, 370.
Green Mts., 106.
Green R., 102 n. 4, 103.
Green River Basin, 99.
Greenland, 65, 82, 83, 84.
Greenock, 18, 19, 204.
Greenwich, 201.
Grenada, W.I., 168.
Grenoble, 213, 233.
Greymouth, 363.
Griqua Land West, 341, 343.
Grisons, 237.
Guadalajara, Mex., 166.
Guadalavir, R., 266.
Guadalquivir, R., 263.
Guadarrama, Sierra de, 263 n. 1.
Guadeloupe, 168.
Guadiana, R., 263.
Guanajuato, 166.
Guardafui, C., 331.
Guatemala, 82, 88, 166.
Guayaquil, 176.
Guayaquil, Gulf of, 69 n.
Guiana, 135, 170, 172, 174.
Guiana, Br., 174.
Guiana, Du., 174.
Guiana, Fr., 174.
Guiana, Plateau of, 70.
Guienne, 211.
Guinea, Gulf of, 332.
Guinea Is., 346.
Guinea, Lower, 285.
Guinea, Upper, 329.
Gujerat, 307, 315.
Gulf Slope, 112.
Gulf states, 143 n. 1.
Gulf Stream, 47, 51, 69, 72, 185.
Gwalior, 314.
Gympie, 357.

HAARLEM, 219.
Hague, The, 219.
Haidarabad, 315.
Hainan I., 321.
Hainaut, 219.
Haleb, 290.
Halifax, N.S., 87, 88.
Halys, R., 287.
Hamburg, 201, 225.
Hamilton, Ont., 90.
Hammerfest, 259.
Hangchau, 326.
Hangchow, 326 n. 4.
Han-hai, 328, 329.
Hankau, 326.
Hankow, 326 n. 4.
Hannibal, 154.
Hanoi, 317.
Hanover, town and prov., 227.
Hanse Towns, 225 n. 2.
Harrar, 345.
Harrisburgh, 140, 150.
Hartford, 114, 135, 140, 145.
Harts Mts., 221, 222, 229.
Harvard, 139.
Hastings, 201.
Havana, 168.
Haverhill, 144.
Havre, 210.
Hawaian Is., 368.
Hawaii, 368.
Hayti, I. and rep., 82, 166, 167.
Hebrides, 186.
Hecla, Mt., 261.
Height of Land, 70, 107.
Hejaz, 302.
Helder, 219.
Helena, 73 n., 142.
Heligoland, 195.
Hellespont, 282.
Helluland, 65 n. 4.
Helsingfors, 254.
Hemisphere, Eastern and Western, 64.
Herat, 305.
Herculaneum, 275.
Heri Rud, R., 305.
Hermopolis, 284.
Herzegovina, 242 n., 280, 281, 283.
Hesse-Darmstadt, 224.
Hesse-Nassau, 228.
Highlands, Scottish, 186.
Highland, Western, U.S., 97–106.
Himalayas, 297, 306, 309, 316.
Hinduism, 290, 312.
Hindu Kush, Mts., 304.
Hinter-Rhine R., 233.
Hiogo, 330.
Hoang-hai, 328 n. 2.
Hoang-ho, 323.
Hobart, 359.
Hoboken, 146.
Hohe Tauern, 239.
Hohe Veenen, 216.
Holland, 82, 195, 213–219, 225.
Holland, N. and S. provs., 219.
Holyoke, 146.
Honda, 176.
Hondo, 329.
Honduras, 82, 83, 166.
Honduras, Br., 166.
Hong-kong, 195, 327.
Honolulu, 368.
Hoosac Mts., 108.
Hoosac Tunnel, 145.
Horizon, 16 n. 1.
Horn, C., 64, 180.
Hot Springs, 158.
Hottentots, 343.
Housatonic Valley, 145.
Houston, 158.
Hovas, 346.
Hudson, 148.
Hudson Bay, 70, 85, 87, 92.
Hudson Bay system, 114.
Hudson Bay Territory, 82.
Hudson Canal, 109.
Hudson Falls, 148.
Hudson, R., 96, 107, 109, 114, 115, 130, 146.
Hudson Strait, 70.
Hue, 318.
Huelva, 263.
Húgli, R., 313.
Huleh L., 299.
Hull, 190, 201.
Humber, The, 190, 201.
Humboldt Bay, 94.
Humboldt Current, 48, 51.
Humboldt Mts., 102.
Humboldt R., 102.
Humboldt Sink, 102.
Hungary, 60, 240, 243, 247.
Huron, L., 84, 90, 115, 116.
Hurricanes, 41.
Hvitramannaland, 65 n.
IBERIAN PENINSULA 257–269, 286, 302, 303.
Iberville, The, 112.
Ice Age, 55 n. 2, 86, 47.
Icebergs, 55, 72.
Iceland, 182, 261.
Ichang, 323 n. 4.
Idaho, 94, 101.
Idaho Ter., 142.
Ijmuiden, 219.
Ij, R., 219.
Ili, R., 294.
Illinois, 112, 132, 133, 124, 129, 130, 131, 136, 137, 140, 151, 152.
Illinois Canal, 133.
Illinois, Peru, 128.
Illinois R., 117.
Illyria, 283 n. 4.
Illyrians, 280.
Ilmen, L., 253 n. 2.
Incas, The, 177.
India, 129, 135, 286, 303, 305–316, 370.
Indian Ocean, 332.
Indian Territory, 111, 130, 137, 138. 141.
Indiana, 111, 122, 123, 129, 140, 151.
Indianapolis, 122, 140, 151.
Indians, American, 81, 87.
Indo-China, 316.
Indus, R., 298, 306.
Inn, R., 231, 233, 234, 235.
Innsbruck, 234, 246.
Interlaken, 239.
Invercargill, 363.
Ionian Is., 283.
Ionian Sea, 277, 281.
Iowa, 111, 122, 123, 130, 136, 140.
Iowa, R., 117.
Irania, 303.
Iranians, 290.
Irawadi, div., 317.
Irawadi, R., 317.
Ireland, 186, 204, 205.
Irish Sea, 189.
Irkutsk, 293.
Iron Gate, The, 279.
Iron Mountain, 128.
Irtish, R., 292.
Isar, R., 228.
Ischia, 275.
Iseo, L., 269.
Isère, R., 213, 231, 233.
Iskenderun, 299.
Isker, R., 279.
Isle Royale, 126.
Isothermal Lines, 50.
Ispahan, 305.
Istria, 239. 246, 247.
Italy, 229, 269–277, 287, 306, 370.
Italy, For. Poss., 174, 255.
Itasca, L., 117.
Ithaca, U.S., 149.

Jackson, 141, 153, 157.
Jacksonville, 157.
Jalide, The, 226.
Jaipur, 315.
Jalon, R., 209.
Jamaica, 72 *n.*, 168.
James Bay, 68.
James R., 108, 109, 115, 156, 329, 330.
James River Canal, 109.
Japan, 67, 135, 329, 330, 370.
Japan, Sea of, 287, 329.
Jassy, 256.
Java, 135, 319-321.
Jedda, 303.
Jefferson City, 140
Jefferson, R., 117.
Jenil, R., 267.
Jerez, 267.
Jersey City, 146.
Jerusalem, 299.
Jews, 241, 281.
Jhelum, R., 216.
Joachimsthal, 245.
Jodpur, 315.
Johnstown, 133 *n.* 1.
Joliet, 152.
Jordan, R., 299.
Jordan, R., U.S., 102.
Jostedalsbrae, 256.
Jucar, R., 267.
Judaism, 290.
Jumna, R., 314.
Jura, Franconian, Mts., 290.
Jura, Mts., 205, 212, 220, 235.
Jutland, 214, 260.

Kabul, 305.
Kabyles, 334.
Kaffirs, 342.
Kaffraria, Br., 343.
Kaiser Wilhelm Land, 363.
Kalahari, des., 333, 343.
Kalmucks, 252.
Kaluga, 255.
Kama, R., 249.
Kamtchatka, 286.
Kanawha Canal, 109.
Kanawha, R., 108.
Kandahar, 305.
Kansas, 111, 123, 128, 130, 131, 154, 155.
Kansas City, 122, 155.
Kansas, R., 117.
Karáchi, 315.
Kara Dagh, 278.
Karakorum Mts., 288.
Karlsbad, 245.
Karnak, 335.
Karroo, Great, 342.
Kars, 296.
Karst, The, 246 *n.* 1, 278.
Kashgar, 288.
Kashmir, 306, 312, 316.
Kaskaskia, R., 130.
Katahdin, Mt., 108.
Katmandu, 316.
Katrine, Loch, 198.
Kattegat, 182, 258.
Kazan, 255.
Kazbek, Mt., 295.
Keewatin, dist., 92.
Kei, Great, R., 343.
Kelat, 305.
Kenia, 321.
Kennebec, R., 144.
Kent, 209.
Kentucky, 112, 125, 129, 141.
Keokuk, 154.
Kerkyra, 283.
Kermadec Is., 360.
Kertch, 254.
Kesho, 317.
Keswick, L., 199.
Keweenaw Pt., 126.
Key West, 157.
Khaibar P., 305, 306, 315
Kharkof, 255.
Khartum, 337.
Kherson, 254.
Khingan Mts., 338.
Khiva, 294.
Khokan, 294.
Kiakhta, 292.
Kief, 255.
Kiel, 226.
Kilauea, 368
Kilimanjaro, 345.
Killarney, Lakes, 204.
Kimberley Dist., 358.
Kimberley, S. A., 342.
King George's Sound, 347, 358.
King Sound, 358.
Kingston, Jam., 168.
Kingston, N.Y., 148.
Kingston, Ont., 90, 107.
Kirghiz, 293, 294.
Kishinef, 255.
Kiusiu, 329.
Kiyoto, 330.
Kizil Irmak, 297.
Klamath, R., 105.
Klausenburg, 247.
Köln, 222 *n.* 2.
Konieh, 296.
Königsberg, 226.
Kordofan, 336.
Korea, 287, 327.
Kosciusko Mountains, 349, 350.
Krefeld, 222.
Krishna, R., 307, 309.
Kuen-lun Mts., 288, 323.
Kuka, 337.
Kurds, 296.
Kurile Is., 287, 329.
Kurisches Haff, 227.
Kuro Siwo, 72.
Kurrachee, 315 *n.* 1.
Kur, R., 295.
Kurrum Pass, 305.
Kwango, R., 341.
Kwathlamba Mts., 331.

Labrador, 70, 85, 92.
Labrador current, 47.
Labuan, 195, 321.
Labyrinth Cañon, 103 *n.* 4.
Laccadive Is., 315.
Lachine Canal, 88.
Lackawanna Valley, 150.
Laconia, 279.
Lacrosse, 153.
Ladoga, L., 184, 250, 288.
Ladrone Is., 285, 368.
La Futa P., 273 *n.* 2.
Lagoa dos Patos, 69 *n.*
Lagos, 339, 340.
La Guayra, 175.
Laguna de la Madre, 69 *n.*
Lahore, 61, 314.
Lake District (Eng.), 198.
Lake States, 143 *n.* 1.
La Mancha, 267.
Lancashire, 208.
Lancaster, U.S., 133.
Land breezes, 58.
Landes, The, 261.
Land's End, 199.
Langres, Plat. of, 207.
Languedoc, 213.
Lansing, 130, 140, 153.
Lansingburgh, 148.
La Paz, 177.
Lapilli, 35.
La Plata, est., 178.
La Plata system, 71.
La Plata, town, 178.
Lapps, 257.
Laramie Plains, 98, 99, 103 *n.* 1.
Laredo, 159, 165.
Larissa, 284.
Larnaca, 296.
La Rochelle, 211.
La Salle, 130.
Latitude and longitude, 17.
Latium, 275.
Launceston, Tas., 359.
Lausanne, 238.
Lava, 35.
La Valletta, 277.
Lawrence, 133, 136, 144, 155.
Leadville, 126, 128, 159.
Leavenworth, 154.
Lebanon Mts., 296.
Lebanon Valley, U.S., 107.
Lech, R., 228.
Leeds, 203.
Leeuwin, C., 347.
Leeward Is., 168.
Leghorn, 275.
Legnago, 272.
Le Havre, 210.
Lehigh Valley, 150.
Leiden, 219.
Leine, R., 227.
Leinster, 204.
Leipzig, 225, 228.
Leith, 203.
Leitha, R., 243.
Lek, R., 215.
Lemberg, 247.
Lena, R., 292, 293.
Leon, 166.
Leontes, R., 299.
Levant, The, 246, 296.
Levkosia, 298.
Levuka, 367.
Lewis R., 101.
Lewiston, 144.
Lexington, 157.
Lhassa, 328.
Liau-ho, R., 327.
Liberia, 340.
Liège, 217, 219.
Liffey, R., 205.
Liguria, 273.
Limfiord, 260
Lille, 203.
Lima, 172, 176.
Limagne, The, 206.
Limoges, 211.
Limousin, 211.
Limpopo, R., 344.
Linares, 263.
Lincoln, U.S., 141, 154.
Lindesnaes, C., 259.
Linnhe, Loch, 198.
Linz, 244.
Lions, Gulf of, 235.
Lisbon, 265.
Lithuania, 255.
Lithuanians, 253.
Little Rocky Mts., 106.
Little Rock, 112, 141, 157.
Liverpool, 190, 202.
Livonia, 254.
Livorno, 275 *n.* 1
Lizard Point, 15.
Llano Estacado, 106.
Llanos, 171, 175.
Loanda, 341.
Lockport, 148.
Lodi, 272.
Loess, 323.
Lofoden Is., 257, 2'9.
Lofty Range, Mt., 357.
Loire, R., 205, 207, 210.
Lombards, 270.
Lombardy, 272.
Lombok I., 364.
Lomond, Loch, 198.
London, 190, 199, 218, 225 *n.* 2.
London, Ont., 90.
Londonderry, 205.
Long Branch, 149.
Long Island, 96, 113, 146, 148.

Long Island City, **146.**
Long Island Sound, **98,** 146.
Long's Peak, 100 *n.* 2.
Lorient, **210.**
Lorraine, **211.**
Los Angelos, **160.**
Louisiana, 82, 112, 124, 131, 137, **141,** 153, 154, 158.
Louisville, 118, 151, **157.**
Louvain, **219.**
Lowell, **144.**
Lower Guinea, Portuguese, **341.**
Low Is., **367.**
Lowland, Eastern, U.S., **106,** 131.
Loyalty Is., **360.**
Lübeck, 225, 226.
Lucerne, 239.
Lucerne, L., 237.
Lu Chu Is., **339.**
Lucknow, **314.**
Lugano, L., 269 *n.* 3.
Lulea, R., 257 *n.* 3.
Luxemburg, 216, **218.**
Luxor, **335.**
Luzon, **321.**
Lynchburgh, **156.**
Lynn, **145.**
Lyons, 207, **208.**
Lys, R., **215.**
Lyttelton, **363.**

Maas, R., 214, **215.**
Macao, 285, **327.**
Macdonnell Ranges, **358.**
Macgillicuddy Reeks, 204.
Mackenzie, R., **71,** 73, **86.**
Macon, **157.**
Madagascar, **346.**
Madeira, I., 285, **345.**
Madeira, R., **177.**
Madison, 140, 153.
Madison Forks, 117.
Madras Pres., 313, **315.**
Madras, town, **315.**
Madrid, **267,** 286.
Madura, 285.
Magdalena, R., **170,** 176.
Magdalena Valley, 175.
Magdeburg, **227.**
Magellan, Str. of, 177, **180.**
Maggiore, L., 231, **269.**
Magyars, 241.
Mahánadi, R., **307,** 313.
Mahé, 285.
Mahmudieh Canal, **236.**
Mahon, 269.
Maimachin, **292,** 329.
Main, R., **221,** 228.
Maine R., 211.
Maine, st., U.S., **98,** 111, **123,** 124, 125, 140.
Mainz, 221.
Malabar Coast, 315.
Malacca, **318.**
Malacca, Str. of, 317.
Maladetta, **263.**
Malaga, **266.**
Mälar, L., 259.
Malay Arch., **318.**
Malay Peninsula, 195, **317.**
Malays, 290, 319, 366.
Malden, **145.**
Maldive Is., **316.**
Malmö, **259.**
Maloja Pass. **233.**
Malta, **195, 277, 329.**
Man, Isle of, **196.**
Manaar, Gulf of, 316.
Manchester, **202.**
Manchester, U.S., **144.**
Manchuria, 85, 322, 327.
Mandalay, **317.**
Manhattan, Is., **96,** 146, 147.
Manich Depression, **181.**
Manich, R., 181.
Manilla, **321.**
Manitoba, **90,** 92.
Manitoba, L., 85.
Mantua, **272.**
Maori, the, 362, 366.
Marble Cañon, **103.**
March, R., **240.**
Marches, The, 275
Marianne, Is., 368.
Marienbad, **245.**
Maritza, R., **277,** 282.
Markland, 65 *n.*
Marmora, Sea of, 182, 280, 281.
Marne, R., **267,** 210.
Maros, R., 240, 247.
Marquesas Is., **367.**
Marquette, **153.**
Marseilles, **213.**
Marshall Is., **368.**
Martaban, **317.**
Martha's Vineyard, I., 96.
Martinique, **168.**
Maryland, 95, 113, **141,** 155, 156.
Marysville, 94 *n.* 2.
Maskat, **303.**
Massachusetts, 81 *n.* 4, 125, 131, 136, **140,** 144, 145.
Massachusetts B., **96.**
Massaua, 345.
Massilia, 213.
Massowah, 345.
Matagorda Bay, 69 *n.*
Matapan, C., **279.**
Mauch Chunk, 130.
Maulmain, **317.**
Mauna Kea, 368.
Mauna Loa, 368.
Mauritius, 195, **346.**
Mayence, 221 *n.* 1.
Mayotte I., 285, **348.**
Mazatlan, **166.**
Meander, R., **297.**
Mecca, 290, **303.**
Mecklenburg-Schwerin, **224.**
Mecklenburg-Strelitz, **224.**
Medina, **303.**
Mediterranean Sea, 34, 42, 45, 48, 64, 77 *n.*, **182.**
Médoc, 211.
Mejerdah, R., **338.**
Mekinez, **339.**
Mekong, R., **317,** 318.
Melanesia, **365, 366.**
Melbourne, 356, **362.**
Memphis, 336.
Memphis, U.S., 93, **112, 157.**
Memel, **226.**
Menado, 321.
Menai Strait, **196.**
Menam, R., **317.** 318.
Menderes, R., **297.**
Mentone, **213.**
Meridians, **18.**
Meriden, **145.**
Merom, Water of, **290.**
Merrimac, R., 144, 145.
Mersey, R., 202.
Merv, **294.**
Mesas, **103.**
Meshed, 305.
Mesopotamia, **301.**
Messenia, 279.
Messina, 276.
Mestizoes, 165.
Meuse, R., **215.**
Mexico, **65,** 66, 68, 72, 78, 80, 81, 82, **83, 162, 166, 270.**
Mexico, Gulf of, 42, 47, 64, **69.** 72, 75, 77, 80, **95,** 110.
Mexico, town, **166.**
Michigan, 111, 114 *n.* 1, 124, 125, 128, 130, 131, 136, 139, **140,** 152.
Michigan Canal, 134.
Michigan, L., **115,** 116, 126.
Michigan, L., tides, 45.
Middle Park, **100.**
Middlesbrough, **201.**
Milan, 229, **272.**
Miletus, **296.**
Milledgeville, **113.**
Milwaukee, **122,** 134, 136, **152, 153.**
Mincio, R., 272.
Minneapolis, 117, 123, 151, **153, 154,** 155.
Minnesota, 111, 114 *n.* 1., 115 *n.* 3. 117, 128, 136, **140,** 152.
Minorca, 269.
Minutes, **18.**
Miquelon, 285.
Mississippi basin, **106, 110, 112,** 117 *n.* 2, 120.
Mississippi Delta, 112.
Mississippi, R., 93, 95, **117, 118, 123,** 150, 154.
Mississippi Sound, 69 *n.*
Mississippi system, **71 114, 116–120,** 134.
Mississippi valley, 66, 68, 75, 77, 81, 82, 125, 132.
Missouri basin, 117 *n.* 3 and 4.
Missouri Mts., **98.**
Missouri, R., 73, **99, 116–118.**
Missouri, st., 111, **122,** 124, 128, 130, 136, **140,** 153.
Mistral, **213.**
Mobile, 124, **157.**
Mobile Bay, 95.
Mocha, **303.**
Modena, 269, **273.**
Mogollon, Mt., **103.**
Mohammedanism, **290.**
Mohammera, 301, **305.**
Mohave Cañon, 103 *n.* 4.
Mohave, des., **71,** 102, **103.**
Mohawk-Hudson depression, 108.
Mohawk valley, 114.
Mohawk Falls, 148.
Moldau, R., **240,** 245.
Moldavia, **255,** 256.
Moluccas, 319, 321.
Molyneux, R., **361.**
Monaco, **213.**
Mondego, R., 265.
Mongolia, **339.**
Mongolian type, **289,** 290.
Monongahela, R., 117, 150.
Mons, 217, **219.**
Monsoon Region, Asia, **289.**
Monsoons, **42,** 308
Montana, 94, 98, 106, 126, **128,** 142, 159.
Montana, the, **176,** 177.
Montenegro, 278.
Monterey Bay, **94,** 121 *n.* 1.
Montevideo, 178 *n.* 1, **180.**
Montgomery, **113, 141, 157.**
Montpelier, U.S., **140, 146.**
Montpellier, **213.**

Montreal, 75, *n.*, 88, 90, 96, 133, 153.
Moon, The, 19.
Moonta, 358.
Moors, 264.
Moraines, 55.
Morava, Bulgarian, R., 278.
Morava, R., Aust., 340.
Morava, R., Servia, 277.
Moravia, 239, 243, 245.
Moravian Gate, 239.
Moray Firth, 198.
Morea, 278.
Mormons, the, 103.
Morocco, emp., 338.
Morocco, town, 339.
Morris Canal, 109, 133
Moscow, 255.
Moselle, R., 221.
Moskva, R., 255.
Mosul, 301.
Moulmein, 317.
Mount Baker, 104 *n.* 1.
Mount Desert, 96.
Mount Harvard, 98 *n.* 1.
Mount Lasson, 105.
Mount Mansfield, 108.
Mount Marcy, 108.
Mount Owen Stanley, 363.
Mount Rainier, 98 *n.* 1, 104, *n.* 1.
Mount Shasta, 104 *n.* 1, 105.
Mount St. Helen's, 104 *n.* 1.
Mount Vernon, 156.
Mount Washington, 97, 108.
Mount Whitney, 98 *n.* 1, 103, 105.
Mozambique, 344.
MozambiqueChannel, 332.
Mukden, 327.
Mulahacen, 262 *n.* 3.
Mülhausen, 226.
Mulhouse, 228 *n.* 4.
Muir Glacier, 161.
München, 228 *n.* 5.
Munich, 228.
Munster, 204.
Mur, R., 245.
Murcia, prov., 266.
Murghab. R., 294.
Murray, R., 350, 351, 355, 356.
Murrumbidgee, 350, 351.
Murviedro, 260.
Muscat, 303.
Muskegon, 153.
Muta, L., 332, *n.* 1.
Mwutan, L., 332.
Mysore, st., 312, 315.
Mysore, town, 315.

Nagasaki, 330.
Nagpur, 315.
Nanaimo, 92.
Nancy, 212.
Nanking, 326.
Nan-shan Mts., 328.
Nantes, 210.
Nantucket I., 96.
Naples, 275.
Narbada, R., 307.
Nari Pass, 305.
Narragansett Bay, 96, 145.
Narrows, The, 96.
Nashua, 144.
Nashville, 141, 157.
Natal, 194, 343.
Natchez, 112, 118, 157.
Navigator Is., 367.
Nebraska, 106, 111, 122, 130, 154.
Neckar, R., 221, 228.
Negd, 302.
Nejd, 302, 303.
Negroponte, 283.
Nelson, R., 86.
Nemausus, 213.
Nepal, 312, 316.
Netherlands, 213–219, 224, 370.
Netherlands, For. Poss., 168, 285.
Neuchâtel, L., 237.
Neusiedler-see, 241.
Neva, R., 249, 254.
Nevada, st., 101, 126, 131, 142.
Névé, 53 *n.*
New Albany, 151.
New Almaden, 126.
New Amsterdam, 82.
New Archangel, 162.
Newark, 149.
New Bedford, 96, 145.
New Brighton, 146.
New Britain, 285.
New Britain, I., 365.
New Brunswick, 83, 149.
Newburg, 148.
Newburyport, 144.
New Caledonia, 366.
Newcastle, 201.
Newcastle, N.S.W., 356, 358.
Newchwang, 327.
New England States, 96, 113, 114, 123, 124, 143 *n.* 1, 144.
Newfoundland, 69, 80, 82, 83, 92, 162.
New Guinea, 363–365.
New Hampshire, 140, 144.
New Hanover, 285.
New Haven, 145.
New Hebrides, 366, 367.
New Ireland, I., 365.
New Jersey, 95, 113, 124, 128, 131, 133, 149.
New Jersey City, 149.
New London, 145.
New Mexico, 66 *n.*, 73, 77, 103, 130, 142, 159, 164, 172.
New Netherlands, 82.
New Orleans, 75 *n.* 77, 82, 93, 118, 124, 132–136, 140, 157, 158.
New Port, 140, 145.
Newport, U.S., 151.
New Siberian Is., 322.
New South Wales, 354, 356, 359, 361.
New Spain, 82.
New Westminster, 92.
New World, 64.
New York Bay, 95, 96.
New York, st., 81 *n.* 4, 82, 93, 111, 114 *n.* 2, 116, 123, 124, 125, 129, 131, 136, 137, 140, 146–149.
New York, town, 75 *n.*, 96, 109, 124, 130–133, 135, 136, 146, 158.
New Zealand, 354, 359–362.
Ngami, L., 333.
Ngaurohoe, 360.
Niagara, Falls of, 86, 115, 116.
Niagara, R., 110, 116.
Nicaragua, 68, 82, 83, 166.
Nicaragua, L., 166.
Nice, 77 *n.* 1, 213.
Nicobar, Is., 313.
Nicopolis, 283.
Nicosia, 296.
Niemen, R., 183.
Niger, R., 332, 339.
Niger, R., Lower, 195.
Niigata, 330.
Nikolaief, 254.
Nile, Blue, 332, 337.
Nile, R., 332, 337.
Nile, White, 332, 337.
Nilgiri Hills, 307.
Nineveh, 301.
Nish, 277, 279.
Nismes, 212.
Niuchwang, 327.
Nizam's Dom., 315.
Nizhni-Novgorod, 255
Norfolk, U.S., 133, 156.
Normandy, 207, 209, 210.
North Atlantic States, 143, 144 150.
North Central States, 143, 150–155.
North Island, The, N. Zd., 360, 362.
North Park, 100.
North Pole, 17, 84.
North River, 96.
North Sea, 44, 189.
North-West, 111 *n.* 6.
North-West Pass., 67, 94.
North-West Prov., Ind., 306, 309, 313, 314.
North-West Territories, 92.
Norway, 246 *n.* 4, 256, 259, 283 *n.* 4, 289, 370.
Nossibé, 285.
Nottingham, 203.
Noumea, 366.
Nova Scotia, 69, 87.
Novaya Zemlya, 248.
Nova Zembla, 248.
Novgorod, 253.
Novi-Bazar, 283.
Nubia, 336.
Numea, 366.
Numidians, 338 *n.* 2.
Nürnberg, 228, 292.
Nyassa, L., 332, 344.

Oakland, 160.
Ob, R., 292, 293.
Obi, R., 293.
Obock, 285, 345.
Ocean ice, 57.
Ocean, Temperature of, 43.
Ocean, The, 42–49.
Odense, 261.
Oder, R., 222, 223, 227.
Odessa, 254.
Ofen, 247.
Ogden, 103, 159.
Ogdensburg, 149.
Ohio, 111, 116, 123, 124, 125, 129–131, 136, 137, 140, 150, 151, 154.
Ohio Basin, 117 *n.* 4, 5.
Ohio Canal, 109, 113, 133.
Ohio, R., 110, 117, 118, 150.
Ohio Valley, 110 *n.* 2.
Oil City, 130.
Oka, R., 255.
Okefinokee Swamp, 112.
Okhotsk, Sea of, 286, 293, 329.
Oklahoma Ter., 141.
Oldenburg, 224, 226.
Oldham, 203.
Old World, 65, 71, 72.
Olympia, 93, 142.
Omaha, 154.
Oman, 302.
Oman, Gulf of, 302.
Onega, L., 164, 250.
Ontario, pr., 90.
Ontario, L., 84, 86, 90, 109, 110, 115, 116.
Oporto, 265.
Oran, 338.
Orange, 149.
Orange Cliffs, 103 *n.* 3.

Orange River, 333, 342.
Orange River Free State, 344.
Oregon, 97 n. 2, 101, 121, 124, 125, 142.
Orinoco Basin, 70, 174, 175.
Orinoco, R., 27 n. 1, 170.
Orissa, 313, 314.
Oristano, Bay of, 276.
Orizaba, 70.
Orkney Is., 196.
Orléannais, 211.
Orléans, 210, 211.
Orontes, R., 298, 299.
Oroya, 172.
Orsova, 279.
Osaka, 330.
Oshkosh, 153.
Ostende, 218.
Osterdal, 259.
Ostyaks, 293.
Oswego, 149.
Oswego Canal, 109.
Otago, 363.
Ottawa, R., 85.
Ottawa, town, 87, 90.
Oudh, 313, 314.
Ouse, R., 199.
Owasco L., 148.
Oxford, 281 n. 2.
Ozark Mts., 97, 106, 111.

Pacific Coast System, 114.
Pacific Ocean, 35 n. 3, 39, 42, 48, 67, 71, 77.
Padua, 273.
Painted Cañon, 103 n. 4.
Palermo, 276.
Palestine, 296.
Palghat Gap, 307, 308.
Pamir Plateau, 304, 328.
Pamlico Sound, 69 n., 95.
Pampas, 171.
Panama, isth., 68, 176.
Panama, town, 176.
Papua, Gulf of, 365.
Papuans, 364.
Paraguay, R., 170, 171, 180.
Paraguay, st., 180.
Parana, R., 170, 171, 178, 180.
Parimaribo, 174.
Paris, 210.
Park Range, 100.
Parma, 269, 272, 273.
Parnassus, Mt., 278
Parramatta, 356.
Parsis, 291, 315.
Passaic R., 149.
Patagonia, 171, 178.
Paterson, 149.
Patna, 314.
Patras, 284.
Pau, 211.
Pauillac, 211.
Pavia, 272.
Peace, R., 72, 86.
Pechili, Gulf of, 323.
Pegu, tn. and div., 327.
Pelho R., 326.
Peipus, L., 184.
Peking, 323, 326, 328.
Pelew Is., 368.
Peloponnesus, 278.
Pembina, 71.
Peneios or Peneus, 278.
Peninine Chain, 196, 199.
Pennsylvania, 81 n. 4, 114 n. 1, 123, 124, 125, 129, 130, 131, 136, 140, 150.
Pennsylvania Canal, 133.
Penobscot Bay, 96.
Penobscot, R., 144.
Pensacola Bay, 95, 125.
Pentland Firth, 196.
Peoria, 152.
Pepper Coast, 340.
Pera, 281
Perm, 248, 293.
Pernambuco, 174.
Persepolis, 305.
Persia, 296, 304.
Persian Gulf, 301, 305.
Perth, Sc., 204.
Perth, W.A., 358.
Peru, 65, 66, 172, 176, 177.
Peru, Upper, 177.
Peruvian Current, 48, 51.
Peschiera, 272.
Peshâwar, 310, 315.
Petchora, R., 249.
Petersburgh, 113, 156.
Pharpar, R., 299.
Phasis, R., 295.
Philadelphia, 75 n., 95, 113, 131, 133, 135, 136, 149.
Philippine Is., 285, 319, 321.
Philippopolis, 279, 283.
Phocæa, 296.
Phœnicia, 296.
Piacenza, 269, 272.
Piedras Negras, 165.
Pierre, 140.
Pietermaritzburg, 343.
Pietra Mala, P., 273 n. 2.
Pike's Peak, 93, 93 n. 1, 100 n. 2.
Pilot Knob, 128.
Pinal, Mt. 103.
Pindus Chain, 278.
Pinsk Marshes, 249.
Pirœus, 284.
Pisa, 275.
Pitt, R., 105.
Pittsburgh, 129, 130, 132, 150, 151.
Plateau Belt, 98, 100.
Platte, R., 73, 100, 117.
Plattensee, 241.
Plenty, Bay of, 360.
Plymouth, 202.
Po, R., 183.
Poitiers, 210, 211.
Poitou, 211.
Poland, 247, 252, 253.
Polders, 215, 222.
Polynesia, 366–368.
Pomerania, 226.
Pompeii, 275.
Pondicherry, 285.
Pontine Marshes, 275.
Popocatepetl, 70, 98 n. 1.
Port Adelaide, 358.
Port Arthur, 90.
Port Dalrymple, 359.
Port Elizabeth, 343.
Port Hamilton, 327.
Port Jackson, 356.
Port Moresby, 365.
Port Phillip Bay, 356
Port Said, 336.
Portland, Me., 90, 94, 96, 133, 144, 161.
Porto, 265.
Porto Cabello, 175.
Porto Rico, 68, 167 n. 6, 168.
Portsmouth, 202.
Portsmouth, U S., 151, 156.
Portugal, 265, 285, 370.
Portugal, For. Pos., 172.
Posen, tn., 227.
Posen, prov., 224, 253.
Poti, 295.
Potomac, R., 109, 115.
Potosi, 177.
Potsdam, 227.
Potteries, The, 203.
Pottsville, 130, 150.
Poughkeepsie, 130, 143.
Powder River Range, 106.
Praga, 255.
Prague, 245.
Prairie Region, 111.
Prairies, 111.
Pregel, R., 216.
Presidios, 285.
Presque Isle, 150.
Pribylov Is., 162.
Prince Edward Island, 88.
Prince's I., 285.
Princeton, 149.
Principe, I., 285, 346.
Pripet, R., 249.
Procida, 275.
Prome, 317.
Provence, 213.
Providence, 96, 114, 140, 145.
Provincia, 213.
Prussia, 224, 227, 370.
Prussia, E., prov., 226.
Prussia, W., prov., 224, 226.
Pruth, R., 255.
Public land, 141.
Puebla, 166.
Puget Sound, 69 n., 94, 94 n. 1, 104, 121, 125, 132, 133, 161.
Pullman, 152.
Puna, 315.
Punjab, 309, 310, 311, 313, 314.
Punta Patinas, 168.
Pustas, 240, 254.
Puys, 206.
Pyramid Cañon, 103 n. 4.
Pyrenees, 183, 205, 279.

Quang-tung, 327.
Quarnero, Gulf of, 239, 246.
Quebec, tn. and prov., 75 n. 2, 84, 85, 87, 88.
Queensland, 354, 357, 359, 361, 36[illegible].
Queenstown, 205.
Quincy, 145, 152.
Quito, 168, 176.
Quittebœuf, 209 n. 2.

Racine, 153.
Rainy L. and R., 86.
Rajputana, 312, 315.
Raleigh, 113, 141, 156.
Ralston des., 102.
Rangoon, 317.
Raniganj, 311.
Raritan R., 149.
Ratisbon, 220, 228.
Ravenna, 273.
Ravi, R., 214.
Reading, 150.
Recife, 174.
Red Cañon, 103 n. 2.
Red River (of the North), 85, 90, 107.
Red River, I.-C., 317.
Red River (trib. Mississippi), 106, 117, 158.
Red River valley, 107, 152.
Red Sea, 42, 48, 302, 345.
Regensburg, 228.
Regina, 92.
Reikjavik, 261.
Reims, 212.
Reno, R., 273 n. 2.
Réunion, 285.
Reuss, R., 238.

Revel, 254.
Rhine, Krumme, 219.
Rhine, Old, R., 219.
Rhine Pr., 212.
Rhine, R., 62, 214, 215, 223, 231, 235.
Rhode Island, 81 *n.* 4, 130, 131, 140, 145.
Rhodope Mts., 279.
Rhone, R., 183, 207, 231, 233, 235.
Rias, 262.
Richmond, U.S., 93, 113, 141, 156.
Rideau R., 87, 90.
Riesengebirge, 221.
Riga, 254.
Riga, Gulf of, 248.
Rigi, Mt., 239.
Rimini, 269.
Rio de Janeiro, 168, 174.
Rio Grande, 93, 94, 97, 115.
Rio Grande del Norte, 100.
Rion, R., 26, 295.
Rio Tinto, 263.
Riu-kiu Is., 329 *n.* 3.
Riverina, 356.
Rivers, 26-28.
Riviera, The, 273.
Roads, 60.
Roan Cliffs, 103 *n.* 3.
Roaring Forties, 41.
Rochefort, 211.
Rochester, U.S., 123, 148.
Rock I., 153.
Rockford, 153.
Rockhampton, 357.
Rocky Mountains, 27, 28, 70, 73, 77, 82, 85, 92, 96, 107, 126, 128, 165.
Rokitno Marshes, 249.
Rome, 59, 246, 275.
Rome, U.S., 148.
Rosa, Monte, 233.
Rosario, 173.
Rotomahana, L., 361.
Rotterdam, 219.
Rotumah, I., 367.
Roubaix, 206.
Rouen, 210.
Roumania, 255, 270.
Roumelia, E., 279, 283, 270.
Rovuma, R., 345.
Ruapehu, Mt., 360.
Rumonsh, 238.
Russia, 53, 58, 60, 85, 129, 134, 135, 248-255, 296, 358 *n.* 1, 370.
Russia, minerals, 252.
Russian Cent. Asia, 285, 293.
Rustchuk, 283.
Ruthenians, 247.
Rutland, 146.

Saale, R., 224, 227.
Saco Falls, 144.
Sacramento, 94 *n.* 2, 142, 159, 160.
Sacramento, R., 80, 94, 105, 121, 159.
Saginaw, 153.
Saguntum, 266.
Sahara, 131, 333.
Saigon, 285, 317.
Salamvria, R., 278, 284.
Salem, 142, 145, 161.
Salford, 202.
Salmon City, 159.
Salmon Falls River, 96.
Salonica, 277, 282.
Salsette, 285, 315.
Salt Lake City, 72 *n.*, 93, 142, 159.
Salt Lakes, 31.
Salt water, Freezing of, 57.
Salwin, R., 317.
Salzburg, 245.
Salzkammergut, 244 *n.* 3.
Samarkand, 294.
Sambre, R., 215.
Samoan Is., 367.
Samos, 285, 296.
Samoyedes, 293.
Sandarbans, The, 309.
Sand-dunes, 25.
Sandhurst, 356.
Sandusky, 150, 151.
Sandwich Is., 368.
San Antonio, 153.
San Diego Bay, 69 *n.*, 94, 95.
San Domingo, 167.
San Felipe, 102.
San Francisco, 61, 93, 94 *n.* 2, 132, 133, 135, 154, 160, 161.
San Francisco Bay, 69 *n.*, 94, 105.
San Francisco Peaks, 103.
San Gorgonio Pass, 94.
San Joaquin, R., 94, 105, 121, 160.
San Jose, 72 *n.*, 160.
San Juan Mts., 100.
San Juan, R., 166.
San Luis Park, 100.
San Pablo Bay, 94.
San Pedro Bay, 94.
San Remo, 273.
San Salvador, Braz., 174.
San Salvador, Cent. Am., 82, 83, 166.
Sangre de Cristo Mts., 100.
Sanpu, R., 328.
Santa Barbara, 121 *n.* 1.
Santa Clara Valley, 160.
Santa Cruz I., 168, 303.
Santa Fe, 159.
Santa Fé, prov., 178.
Santander, 267.
Santiago, 178.
Saône, R., 207, 212.
Saracens, 270.
Saratoga Springs, 148.
Sarawak, 321.
Sardinia, I., 276.
Sardinia, kgd., 272.
Sargasso Sea, 47 *n.* 5.
Saskatchewan, 92.
Saskatchewan, R., 73, 85, 86, 92.
Savannah, 124, 156.
Savannah Harbor, 95.
Savannahs, 112, 115, 133, 136.
Save, R., 240, 241, 247 277, 280.
Savoy, 212.
Sawákin, 337.
Sawatch Range, 100.
Saxe-Altenburg, 225 *n.*
Saxe-Coburg-Gotha, 225 *n.* 1.
Saxe-Meiningen, 225.
Saxe-Weimar, 225.
Saxon Switzerland, 228.
Saxony, kgd., 222, 223, 224, 270.
Saxony, prov. Prus., 227, 229.
Scandinavia, 229, 256-259, 260.
Scandinavian origin, Names of, 203 *n.* 2.
Scheldt, R., 208, 215, 218.
Schenectady, 148.
Schleswig-Holstein, 236.
Schuylkill, 150.
Schwarzawa, R., 245.
Scotland, 196, 198.
Scranton, 130, 150.
Scutari, L., 278.
Scutari, town, Asia Minor, 296.
Sea-breezes, 38.
Seasons, 19.
Seattle, 161.
Sebastopol, 254.
Se-chwan, 324.
Seconds, 18.
Seeland, I., 260, 261.
Seine, R., 207, 209, 210.
Selenga, R., 292.
Seleucia, Mesop., 301.
Seleucia, Syr., 299.
Selvas, 171.
Semitic langs., 290.
Semmering Pass, 234.
Seneca Canal, 109.
Seneca Lake, 110, 149.
Senegal, R., 339.
Senegal, 285.
Senegambia, 285.
Seraing, 219.
Serayevo, 263.
Sereth, R., 255.
Servia, 280, 283, 270.
Seul, 327.
Severn, R., 199, 203.
Seville, 61, 263, 266.
Seychelle Is., 346.
'S Gravenhage, 219.
Shamo, 329.
Shanghai, 326.
Shannon, R., 204
Shan-si, 323 *n.* 1.
Shan States, 318.
Shan-tung, 323.
Shar Dagh, 278.
Sharon, Plain of, 296.
Shat-el-Arab, 301.
Sheffield, 203.
Shenandoah Valley, 108.
Shetland Is., 196.
Shiites, 305.
Shipka Pass, 279.
Shiraz, 305.
Shoalwater Bay, 94.
Shoshone Fall, 101.
Shoshone R., 101 *n.* 1.
Shoshong, 343.
Shreveport, 112, 153.
Siam, Gulf of, 287, 317.
Siam, kgd., 318.
Siberia, 67, 77, 85, 252 *n.* 5.
Sicily, 270, 276.
Sidon, 299.
Siena, 275.
Sierra Leone, 339.
Sierra Madre Mts., 70.
Sierra Morena, 262.
Sierra Nevada, U.S., 70, 72, 73, 78 *n.*, 93, 104, 105, 289.
Sierra Nevada of Santa Marta, 170.
Sierra Nevada Sp., 262.
Sikhs, 314.
Si-kiang, R., 327.
Sikoku, 329.
Silesia, Aust., 239, 245.
Silesia, Prus., 222, 224.
Silver City, 159.
Simla, 315.
Simplon Pass, 233.
Sinai, Mt., 302, 303.
Sind, 313, 315.
Sindhia's Dominion, 314.
Singapore, 318.
Sinter Siliceous, 30.
Sir, R., 294, 328.
Sitka, 93, 142, 162.
Skager Rak, 182.
Skerries, 257.
Skodra, L., 278.
Slatington, 150.
Slave Coast, 339.
Slavonia, 247.
Slavs, 224, 241, 280.
Smith Sound, 94.
Smyrna, 296.

Snake R., 99, 101.
Snake River Plains, 101.
Snow-line, 53.
Society Is., 307.
Socotra, 195.
Soerabaja, 321 *n.* 2.
Sofala, 344.
Sofia, 277, 283.
Solomon Is., 366, 367.
Solway Firth, 196.
Somali Land, 345.
Somme, R., 209.
Song-ka, R., 317.
Song-koi, R., 317, 318.
Sonora R., 95.
Sonora St., 165.
Sorata, Mt., 62.
Soudan, 333.
Soudan, Egypt, 336.
Soudan, Indep., 337.
Sound, The, 260.
South Atlantic States, 143, 155–157.
Southampton, 208.
South Australia, 354, 357, 358.
South Bend, 151.
South-Central States, 143, 157–159.
Southern Alps, 360, 361.
South Island, N.Zd., 360, 361.
South Park, 100.
South Pass, 95.
South Pole, 17.
South-West, 111.
Spain, 77, 82, 265–269, 289, 358, 370.
Spain, For. Poss., 168, 172.
Sparta, 284.
Spencer Gulf, 347, 357.
Spezia, 275.
Spice Is., 321.
Spitzbergen, 248 *n.* 1.
Split Mts. Cañon, 103 *n.* 2.
Splügen Pass, 228, 233, 238.
Spokane Falls, 72 *n.*, 120, 161.
Spokane Plateau, 101.
Sporades, 283.
Spree, R., 227.
Springfield, 140, 146, 151, 152.
Springs, 30.
Srinagar, 316.
St. Anthony, Falls, 117, 154.
St. Augustine, 157.
St. Bartholomew, 81 *n.* 5.
St. Bernard, Great Pass, 233.
St. Clair, L., 115.
St. Croix, 96.
St. Elias, Mt., 98 *n.* 1, 161.
St. Etienne, 206.
St. George I., 162.
St. Gothard Pass, 233.
St. Gothard Tunnel, 272.
St. Helena, 346.
St. John I., 284.
St. John R., 88.
St. John's, N. Bruns., 88.
St. John's, N. Found., 92.
St. Joseph, 154.
St. Joseph Falls, 151.
St. Lawrence basin, 68, 107.
St. Lawrence, Gulf, of, 75.
St. Lawrence, R., 84, 85, 88, 90, 107, 118.
St. Lawrence system, 70, 114. 115, 116.
St. Lawrence Valley, 107.
St. Louis, 75 *n.*, 118, 122, 124, 132, 133, 134, 151, 153, 154, 155, 158.
St. Lucia Bay, 344.
St. Marie, 285.
St. Martin I., 285.
St. Mary's Canal, 115
St. Nazaire, 211.
St. Paul, 93, 117, 140, 153, 154.
St. Paul, Kodiak I., 162.
St. Paul I., 162.
St. Petersburg, 253 *n.* 2, 254.
St. Pierre, 235.
St. Roque, Cape, 168.
St. Simon's Sound, 95.
St. Thomas, I, Af., 285, 346.
St. Thomas, W.I., 168.
St. Vincent, I., Af., 346.
St. Vincent, Gulf, 357, 358.
Staffa, I., 196.
Staked Plain, 106.
Stalactite, 29.
Stalagmite, 29.
Stanley Falls, 340.
Stanley Pool, 340.
Stanovoi Mts., 291.
Stanthorpe, 357.
Staasfurt, 223.
Staten Island, 96, 146.
Steppes, 58; — Rus., 252.
Stettin, 226.
Stewart I., 360.
Stillwater Cañon, 103 *n.* 4.
Stockholm, 259.
Stockton, U.S., 160.
Straits Settlements, 195.
Strassburg, 228.
Stratford-upon-Avon, 203.
Stuttgart, 228.
Styria, 234, 245.
Suabian Alps, 220, 228.
Suakim, 337.
Suchau, 328.
Sucre, 177.
Sudetes Mts., 221, 239.
Sues Canal, 336.
Suez, Gulf of, 302.
Suez, town, 336.
Sulsun Bay, 94.
Sulaiman Mts., 304.
Sulu Is., 285.
Sulu Arch., 319.
Sumatra, 287. 318, 321.
Sunda Is., 319.
Sunda Is., Lesser, 321.
Sunnites, 305.
Superior, L., 86, 90, 115, 116, 126, 128, 134, 150.
Surabaya, 321.
Surat, 315.
Surinam, 174. 285.
Susquehanna, R., 109, 115, 133, 149, 150.
Suva, 367.
Svealand, 258.
Swan, R., 358.
Swansea, 202.
Sweden, 256, 258, 370.
Swedes, 253.
Sweetwater Valley, 99
Swinemünde, 226.
Switzerland, 234–239, 370.
Sydney, 356, 362.
Syra, I., 284.
Syracuse, 276.
Syracuse, U.S., 148, 149, 153.
Syria, 285, 297, 298.
Szegedin, 247.

TABLE BAY, 49.
Table Mtn., 293.
Tabriz, 296, 305.
Tacoma, 94, 161.
Taconic Mts., 108.
Taganrog, 254.
Tagus, 263.
Tahiti, 367.
Tallahassee, 141, 157.
Tamil (lang.), 312.
Tana, R., 245.
Tanganyika, L., 332, 344.
Tapti, R., 307, 315.
Tarai, The, 309.
Tarim Basin, 328.
Tashkent, 294.
Tasmania, 194, 354, 359.
Tatars, 252.
Tatra, Mts., 240.
Taunton, U.S., 145.
Taunton Falls, 145.
Taupo, L., 360.
Taurus Mts., 297.
Tay, Firth of, 204.
Taygetos, Mt., 279.
Tees, R., 201.
Teheran, 305.
Tehuantepec, 166.
Tehuantepec, isth., 165.
Tejon Pass, 105.
Tell, The, Alg., 338.
Tell, The, Mor., 339.
Telugu (lang.), 312.
Temesvar, 247.
Temperature, Variations of, 25.
Tenasserim, 317.
Teneriffe, 40, 345.
Tennessee, 97 *n.* 1, 112, 125, 129, 141, 157.
Tennessee, R., 107.
Tennessee, Valley of East, 108.
Termites, 57.
Terre Haute, 130, 151.
Texan systems, 73.
Texas, 73 *n.* 4, 82, 95, 111, 123, 120, 131, 141, 158.
Texas rivers, 106.
Texas system, 114, 115 *n.* 1.
Texel, I., 214.
Texcuco, L., 166.
Thames, R., 199.
Thebes, 335.
Theiss, R., 28, 240, 247.
Thessaly, 278, 283.
Thousand Islands, 116
Throndhjem, 259.
Thun, L., 235, 237, 239.
Thüringerwald, 220.
Thuringian Fo 220, 229.
Thuringian States, 239
Tian-Shan Mts., 35, 288, 293, 328.
Tiber, R., 275.
Tibet, 62, 306, 328.
Ticino, R., 233, 272.
Tides, 43, 44.
Tientsin, 326.
Tierra del Fuego, 177, 180.
Tiflis, 61, 295, 297.
Tigris, 296, 301.
Timbuktu, 332, 345.
Timok, R., 279.
Timor, 285, 321.
Tirnova, 279.
Titicaca, L., 176, 177.
Titusville, 130.
Tobago, 168.
Tobolsk, 292, 293.
Togo Land, 285, 340.
Tokiyo, 329, 330.
Toledo, U.S., 150, 151 152.
Toledo, Sierra, 263.
Toltecs, 165.
Tombstone, 159.
Tomsk, 293.
Tonga Is., 367.

Tongariro, Mt., 360.
Tongking, 285, 318.
Tongking, Gulf of, 287.
Tönning, 226.
Toowoomba, 357.
Topeka, 141, 155.
Toronto, 90.
Torrens, L., 351.
Torres Str., 349, 357.
Toul, 212.
Toulon, 213.
Toulouse, 213.
Toundras, 77, 85.
Touraine, 211.
Tourcoing, 208.
Touro, 311.
Townsend, Mt., 349.
Trade-winds, 39, 72.
Trans-Caspian Territory, 285, 294.
Trans-Caucasia, 130, 296.
Transkei, 343.
Trans-Leithan crown-lands, 243, 247 *n.* 2.
Transvaal, 343.
Transylvania, 240, 247.
Trasimeno, L., 270.
Trebizonde, 296.
Trent, R., 199, 203.
Trent, town, 234, 246.
Trenton, 113, 140, 149.
Trieste, 234, 239, 246.
Trieste, Gulf, 239.
Trinidad, 168.
Trinity Bay, 92.
Trinity R., 115.
Tripoli, 337.
Tristan da Cunha, 346.
Tromsö, 259.
Tropics, 20:—*Vegetation of*, 57.
Troy, U.S., 114, 148.
Tucuman, 178.
Tueson, 142.
Tula, 255.
Tunguses, 293.
Tunis, Gulf of, 338.
Tunis, st., 285, 337.
Tunis, town, 338.
Tunja, R., 283 *n.* 2.
Turin, 233, 272.
Turkey-in-Asia, 296, 297.
Turkey-in-Europe, 281, 370.
Turkestan, E., 328.
Turtle Is., 176.
Tuscany, 269, 273
Tweed, R., 196.
Two Ocean Pass, 27
Tyne, R., 196.
Typhoons, 41, 321.
Tyre, 299.
Tyrol, 234.

Uintah Mts., 102 *n.* 4, 103.
Ukerewe, L., 331.
Ulm, 223.
Ulster, 204, 205.
Umbria, 275.
Union Canal, 109.
United Kingdom, 370.
United States, 80, 81, 83, 93, 161.
Upsala, 259.
Ural Mts., 181, 248.
Ural, R., 181, 183.
Uri, Bay of, 233.
Uruguay, R., 176.
Uruguay, st., 178–180.
Urumia, 295, 296.
Usagara, 285.
Usedom, I., 226.
Usküb, 278.
Utah, 73 *n.*, 101, 126, 128, 131, 142, 159.
Utica, 148.
Utrecht, 219.

Vaal, R., 344.
Valais, Alps of, 231.
Valdai Hills, 183.
Valencia, Gulf of, 269.
Valencia, prov. and town, 266.
Valentia, 197
Valladolid, 267.
Valparaiso, 176.
Valparaiso Harbor, 69 *n.*
Vancouver, I., 69, 92.
Vancouver, town, 92.
Van Diemen's Land, 359.
Van, L., 295, 296.
Vardar, R., 278.
Varna, 283.
Vecht, R., 219.
Venezuela, 168, 170, 174, 175.
Venice, 217, 246, *n.* 1. 272, 281.
Vera Cruz, 72 *n.*, 100, 166.
Verde, Cape, Is., 346.
Verdun, 212.
Vermont, 123, 140, 146.
Verona, 272.
Versailles, 210.
Verviers, 219.
Vesuvius, Mt., 275.
Via Æmilia, 269.
Via Mala, 233.
Vicksburg, 112, 157
Victoria, Br. Col., 92.
Victoria, Col. of, 354, 355, 356, 357, 359.
Victoria, Hg.-kg., 337.
Victoria Land, 369
Victoria Nyanza, L., 331
Vienna, 75 *n.*, 234, 244.
Vienna, R., 211.
Vilna, 255.
Vinland, 65 *n.*
Virginia, 95, 97 *n.* 1, 113, 125, 127, 130, 137, 141, 156.
Virginia City, 159.
Virginia, St., Valley, 108.
Virginia, West, 141.
Virgin Is., 168.
Visigoths, 209. 264.
Vistula, R., 233, 241, 247, 255.
Viti Levu, 367
Vladikavkas, 295.
Vlieland, I., 214.
Vogesen, Mts., 220.
Volcanoes, 35.
Volga, R., 183.
Volturno, R., 276.
Vosges, Mts., 205.

Waal, R., 215.
Wabash, R., 117, 151.
Wadi Halfa, 336 *n.* 3
Wahsatch Mts., 362.
Waikato, R., 361
Wales, 189, 195.
Wallace's Line, 364 *n.* 2.
Wallachia, 255, 256.
Walla Walla, 161.
Wallenstadt, L., 237.
Waltham, U.S., 145.
Walvisch Bay, 285, 341
Warsaw, 255.
Warta, R., 227.
Wasatch Mts., 70, 101, 102.
Wash, The, 199.
Washington, 77 *n.*, 97 *n* 2. 113 137, 138. 156.
Washington Ter., 101, 121, 125, 130, 142.
Waterbury, 145
Waterloo, 219.
Water-parting, 26.
Watertown, 149.
Watling I., 167 *n.* 5.
Watten, 225 *n.* 3
Watupha R., 145.
Waves, 43.
Weimar, 229.
Welland Canal, 115
Wellington, 361.
Wener, L., 194.
Weser, 201.
West Australia, 354 358, 359.
West Bay City, 153.
West Indies, 41, 67, 68, 72, 81, 82. 166–168.
West Indies, Brit., 83.
West Indies, Sp., 88
West Indies, Fr Dan. Dist., 83.
West Point, 138.
West Troy, 143.
Westerdal, 259.
Western States, 143.
Westminster, 201.
Westphalia, 222.
Westport, N. Zd., 363.
Wetter, L., 194.
Wheeling, 151.
Whirlpool Cañon, 103 *n.* 2.
White Mts., 103.
White Sea, 182.
Wichita, 155.
Widdin, 283.
Wieliczka, 247.
Wight, I., 196.
Wilhelmshaven, 226.
Wilkesbarre, 130, 150.
Willamette, R., 94, 104.
Willamette Valley, 120, 161.
Williamsport, 150.
Wilmington, 113, 150, 156.
Wilmington Harbor, 95. 106.
Wilson's Promontory, 347.
Wimmera Dist., 355.
Wind River Range, 99.
Wind River Valley, 99.
Windermere, L., 199.
Winds, 38–42, 50.
Windsor, 203.
Windward Is., 168
Winnebago, 153.
Winnipeg, L., 75 *n*, 85, 86, 90, 107, 115 *n.* 2.
Winnipeg, R., 86.
Winnipeg, town, 90.
Winnipegosis, L., 90.
Winono, 154.
Wisby, 259.
Wisconsin, 111, 125, 128, 136, 140, 152.
Wisconsin, R., 117.
Wismar, 226.
Woods, L. of the, 84, 97.
Worcester, U.S., 133, 145.
Wotchish Hills, 107.
Würtemberg, 220, 224, 225, 228, 270.
Wusung, R., 326.
Wyoming, 98, 103, 130, 142.

Xenil, 267 *n.* 1.
Xerez, 267 *n.* 1.

Yablonoi Mts., 291.
Yaila Mts., 254.
Yakuts, 293.
Yakutsk, 293.
Yale University, 139.
Yanaon, 285.
Yang-tse-kiang, 323.
Yanina, 282
Yankton, 154.
Yarkand, 328.
Yarra, R., 356.
Yellow River, 323.
Yellow Sea, 287, 323.

Yellowstone National Park, **98**, 117.
Yellowstone Region, 27 *n.* 2, **99**.
Yellowstone R., **99**, 117
Yemen, **302**.
Yenisei, R., 292.
Yezd, **307**.
Yezo, 49, **92**.
Yokohama, **330**.
Yonkers, 148.
Yonne, R., **207**.
York, C., 347, 349.
Yorkshire, **203**.
Yosemite Valley, **105**.
Yucatan, 69, **164**.
Yucatan Channel, **89**.
Yukaghirs, **293**.
Yukon, R., 71, 80, 161, 162
Yuma, 72 *n.*
Yün-nan, **326**.
Yvetôt, 209 *n.* 2.

ZAMBEZI, R., 331, **333**.
Zante, **283**.
Zanzibar, 335, **344**.
Zaragoza, 269.
Zerafshan, R., **294**.
Zirknitz, L., 31, **246**.
Zones, **21–22**.
Zoroastrianism, **290**, 291, **305**.
Zuider Zee, **214**, **219**.
Zulus, **342**.
Zuni Mt., **103**.
Zürich, tn., **233**.
Zürich, L., **237**.
Zwjttawa, R., **245**.

COMMERCIAL INDEX

TO

LONGMANS' SCHOOL GEOGRAPHY

Aqueducts, 66, 164, 177.
Agave, 164, 185, 266.
Agriculture, 75, 121-125, 135, 140-143, 187, 204, 208, 216, 223, 241, 251, 255, 267, 270, 292, 293, 296, 301, 309, 324, 335, 342, 361.
Alligator, 80, 353.
Alfa, 338.
Alpaca, 172.
Amber, 222.
Area (of North American States), 83; (of various countries), 370, 140.
Asphalt, 168.

Bananas, 319, 365.
Barley, 90, 122, 127, 164, 186, 336, 345.
Beets, 124, 208, 216, 223, 227, 228.
Blue-fish, 80.
Boots and shoes, 127, 131.
Butter, 123, 191, 192, 205, 216, 361.

Cacao, 78, 164, 168, 174, 175, 176, 346.
Cactus, 73, 78, 185, 266.
Camels, 252, 280, 294, 302, 304, 324, 334.
Canals, 85, 88, 90, 94, 109, 115 (Welland), 116, 120, 132, 133, 176, 184, 198, 202, 205, 211, 212, 213, 216, 219, 225, 247, 249, 254, 271 (Suez), 273, 283, 293, 326, 336.
Castor oil, 266.
Cattle, 122, 123, 175, 240, 252, 260, 280, 294, 296, 343, 355, 361.
Cheese, 123, 184, 191, 192, 216, 237, 272, 361.
Chemicals, 135.
Cinchona, 321 (see Quinine).
Clothing, 127, 131, 132.
Coal, 80, 85, 87, 88, 92, 109, 127, 129, 130, 186, 191, 192, 208, 217, 222, 237, 241, 244, 245, 252, 263, 270, 292, 311, 321, 326, 342, 356, 359, 362.
Cochineal, 80, 345.
Coco-nut, 302, 310, 319, 346, 365, 367.
Cod, 80, 92, 187, 259.
Coffee, 135, 164, 166, 167, 168, 174, 175, 176, 216, 303, 309, 315, 316, 321, 340, 341, 357, 367.
Copper, 80, 90, 116, 121, 126, 127, 128, 175, 177, 252, 259, 263, 296, 342, 357, 358.
Copra, 365.
Cotton, 77, 112, 121, 123, 124, 127, 134, 164, 174, 175, 191, 208, 217, 222, 228, 240, 244, 252, 259, 265, 266, 280, 297, 298, 304, 308, 309, 311, 315, 324, 335, 341, 357, 367.
Cork, 264.
Currants, 71, 77, 92.

Dates, 266, 302, 304, 310, 333.
Durrah, 302, 333.
Dye-woods, 166.

Eider-down, 259.

Flax, 125, 216, 244, 254, 362.
Flour, 117, 123, 127, 191.
Forests, 110, 111, 125, 171, 176, 207, 220, 223, 240, 244, 251, 257, 267, 280, 292, 295, 309, 316, 319, 333, 346, 353, 355, 361, 363.
Fruit, 116, 124, 135, 168, 177, 185, 186, 228, 241, 264, 276, 296, 297, 304, 342, 357.
Furs, 85, 228, 251, 292.

Gas, 129.
Glass, 129, 132, 245.
Goats, 246, 280, 297, 342.
Gold, 65, 80, 92, 120, 126, 127, 175, 241, 252, 293, 326, 340, 354, 355, 356, 357, 358, 359, 362.
Grain, 72, 94, 202, 216, 223, 237, 241, 259, 260, 302, 315, 316, 335, 339, 342, 343, 355.
Graphite, 292.
Grazing, 67, 122, 135, 144, 178, 216, 223, 237, 252, 257, 270, 296, 342-3, 354, 361.
Guanaco, 178.
Guano, 176, 178.
Gum, 303, 362.

Halibut, 80.
Hay, 123.

Hemp, 164, 252 (Manilla), 321.
Herring, 80, 187, 259.
Hides, 125, 135, 164, 178.
Hops, 125, 127, 190, 223.
Horses, 123, 175, 252, 261, 280, 294, 302, 304, 324, 355, 361.

Ice, 161.
India-rubber, 135, 164, 166, 174, 340, 341.
Indigo, 166, 216, 309, 311, 327.
Iron, 80, 88, 90, 127, 128, 129, 131, 132, 133, 135, 167, 186, 191, 192, 217, 222, 237, 241, 245, 252, 259, 263, 270, 342.
Irrigation, 73, 102 (also n. 2), 120, 121, 160, 164, 177, 264, 266, 267, 273, 291, 297, 301, 304, 309, 335, 351, 355, 358.
Ivory, 292, 340.

Jute, 309, 311.

Kangaroo, 263.

Lead, 126, 127, 128, 199, 222, 263, 276, 292.
Leather, 127, 131, 135.
Lignite, 130.
Linen, 192, 205, 217, 244.
Llama, 172.
Lumber, 87, 88, 90, 108, 118, 121, 125, 127, 131, 133, 166, 247, 358. (See Timber.)

Machinery, 127, 131, 217.
Mackerel, 80.
Maguey, 78.
Maize or Corn, 78, 88, 112, 122, 124, 127, 164, 187, 208, 223, 237, 240, 241, 245, 252, 255, 272, 280, 328, 343, 367.
Manioc, 167, 174, 346.
Manufacturing, 126, 131, 134, 135, 140, 143, 203, 217, 222, 223, 237, 241, 244, 251, 265, 270, 296, 330, 355.
Millet, 309, 324.
Mulberry, 208, 310.

Nitrate, 176, 178.

Oats, 88, 122, 123, 127, 187, 190, 216, 252, 257, 345, 361.
Oil, 122, 127, 270, 309, 340, 341, 365.
Olive, 208, 264, 266, 270, 272, 275, 280, 288, 297, 358.
Opium, 304, 309, 311, 324, 326.
Oranges, 112, 124, 272, 276, 280, 297, 345.
Ostrich, 172, 302, 333, 342, 343.
Oysters, 80.

Pearls, 316, 358.
Peat, 216.
Peruvian Bark, 176, 316. (See Quinine.)
Petroleum, 80, 129, 130, 134, 247, 295, 335.
Pimento, 168.
Platinum, 252.
Population (of North American States), 83; (of various countries), 370, 140, 187.
Pork, 123.
Potatoes, 78, 88, 123, 127, 167, 223.
Prairie Dog, 172.
Precious Stones, 135, 175, 252.
Provisions, 122, 131, 134.
Pulque, 164.

Quinine, 176, 346 (See Cinchona).
Quicksilver, 80, 126, 127, 263.

Reindeer, 77, 251, 258.
Rice, 112, 124, 127, 216, 240, 272, 304, 309, 311, 316, 317, 320, 324, 327, 328, 330, 340, 346.
Roses, 305, 316.
Rye, 122, 127, 187, 223, 252.

Salmon, 80, 120, 187.
Salt, 73, 80, 100, 127, 131, 222, 241, 247, 263, 265, 270.
Sardines, 210.
Seal, 78, 92.
Shad, 80.
Sheep, 122, 123, 244, 246, 261, 264, 267, 275, 297, 342, 343.
Ship-building, 96, 204, 217, 310.
Shipping, 257.
Silk, 135, 208, 222, 237, 245, 266, 270, 272, 316, 324, 325, 326, 327, 328, 330.
Silver, 65, 80, 126, 127, 164, 176, 177, 222, 241, 245, 276, 292, 356.
Soil, black, 111, 251, 292, 308, 309; red, 324; yellow, 323, 325.
Sorghum, 124.
Spices, 174, 216, 309, 321.
Sponges, 167.
Steel, 131, 132, 135.
Sturgeon, 249.
Sugar, 112, 124, 127, 131, 132, 135, 164, 167, 168, 174, 175, 176, 191, 208, 216, 223, 266, 309, 315, 320, 321, 324, 327, 341, 343, 346, 357, 365, 366, 368.
Sulphur, 263, 270.
Swine, 122, 280.

Tar, 113.
Taro, 365.
Tea, 135, 191, 252, 292, 309, 311, 316, 321, 324, 326, 327, 330.
Teak, 309, 317.
Timber, 257 (See Lumber).
Tin, 128, 199, 222, 245, 321, 356, 357, 359.
Tobacco, 78, 88, 125, 127, 131, 134, 135, 164, 167, 175, 208, 223, 237, 280, 297, 304, 309, 321, 367.

Vanilla, 78, 164.
Vine, 78. 186, 342.
Vizcacha, 172.

Whaling, 341.
Wheat, 85, 90, 122, 123, 127, 164, 177, 178, 187, 190, 191, 208, 216, 240, 241, 245, 252, 264, 276, 292, 304, 309, 311, 315, 324, 328, 330, 355, 356, 357, 361.
White-fish, 80.
Wine, 90, 124, 208, 211, 212, 216, 223, 237, 241, 245, 254, 265, 267, 270, 272, 288, 297, 298, 316, 328, 345, 355, 357.
Wool, 123, 127, 134, 178, 180, 191, 208, 212, 222, 223, 244, 354, 355, 356.
Woollen Goods, 123, 127, 131, 217, 245, 292.

Zinc, 127, 128, 217, 222, 276.

QUESTIONS

BASED ON

LONGMANS' SCHOOL GEOGRAPHY,

AND

LONGMANS' NEW SCHOOL ATLAS.

THE following questions are not intended to be exhaustive of the text-book on which they are based. To have attempted that would have been to encroach too much on the province of the teacher. The aim has been to suggest questions of a kind fitted to develop the thinking powers of the student, and hence the questions are for the most part of such a nature as to involve a comparison of different parts of the text-book. Preferences are given to the pages of the work on which the several questions are based, and as nearly as possible to the precise passages from a comparison of which the materials for answers are to be collected.

AMERICA.

1. How would you explain the limited area occupied by civilized nations in America before the arrival of Europeans? State what circumstances favored the growth of civilized nations in the regions where they were to be found. See pp. 65–7, and comp. pp. 23 (bottom), 52 (3) (*b*), 59 (near the top).

2. Mention some of the steps by which knowledge of America progressed during the 15th, 16th, 17th, and 18th centuries. What erroneous belief had previously existed? See p. 67.

3. From what point of view is America an old land? See p. 64, and consult Geological Map.

4. What general resemblances are there between the land mass of the Western Hemisphere and that of the Eastern? See pp. 64, 65, and comp. pp. 68–9, 71 (near top). Consult Hemispheric Map.

5. In respect to movements of population how does America differ from Europe and Asia? See pp. 65, 187–8, 289–90, 319, 366.

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6. What similarity in the above respect is there between Europe and America? With which continent does Australia compare? See pp. 188 (near top), 354.

7. What has been the effect on the aborigines of the contact with Europeans in the New World? See pp. 67, 81, 172, 177 (8), 353 (foot), 359 (fine print).

8. What hindrances to the development of a high civilization existed in the New World? See pp. 65, 67, 353, and comp. p. 192.

9. In what ways did the civilization that was attained compare with that of the great early nations of the world? See pp. 65, 66, 67, and comp. 59 and 60.

10. Can you mention any names of natural features or towns that illustrate the fact mentioned on p. 68 (near the top). Consult Maps.

NORTH AMERICA.

11. Why should there be any question as to the size of North America? See p. 68. Comp. Question 268.

12. What similarity is there between its real continental outline and that of Europe? See pp. 69, 182.

13. In what two ways is the coastwise navigation of North America assisted? See p. 69.

14. How do you explain the formation first mentioned in p. 69 and Note 3? See p. 33.

15. What is the great benefit that is derived from the Gulf of Mexico? See pp. 69, 75 (first paragraph in coarse print), 120 (near top), and consult U.S.A. Rainfall Map. Compare Hudson Bay with the Gulf with respect to utility to commerce. See p. 70, 86, 118 (middle), 158 (middle). Comp. Question 272.

16. Compare the Gulf of Mexico and the Mediterranean Sea with respect to form, oceanic connections, historical importance, and value to commerce. See pp. 64 (foot), 69, 182, 184, 336 (top).

17. What are the general points of similarity between the surface features of North America and those of South America? See pp. 70–71.

18. How do the corresponding features in the two continents compare in latitude? See Maps.

19. On account of these differences of latitude, which of the great prevailing winds do we find most widely influential in South America, and which in North America? See pp. 39-41, 72 (2), 171 (fine print).

20. Why should Boothia Felix be the centre of the greatest cold of North America? See p. 71 and consult Map, considering latitude, direction of winds, and distance from warm ocean current.

21. In which part of the Old World would you look for its area of greatest cold? See p. 51 and comp. p. 289.

22. What part of the Old World has a climate similar to that of the Mohave desert? See pp. 71, 302, 333.

23. What similarities are there between the climates of the eastern and the western halves of the Old and New Worlds respectively. See pp. 71–5, 185 (last half), 289.

24. What circumstance goes toward accounting for the dryness of the Pacific Slope in Southern California? See pp. 51–2, 72 (2, fine print), and compare 333 (fine print).

25. What effect does the greater warmth of the western part of North America have upon the latitude at which trees are found. See p. 72, and consult Vegetation Map in Atlas. Is there a similar effect noticeable in the Old World? See Question 282.

26. Explain the dryness of Western Mexico and of the plateau east of the Cascade Range. See pp. 52 (3) (*a*), 72 (and *n.* 7), 73.

27. Why should there be sand dunes on the east side of Lake Michigan? See pp. 116 (fine print), 25 (below middle).

28. What connection is there between the existence of Great Salt Lake and the mountains to its west? See pp. 100, 101 (2), 52 (3) (*a*).

29. What would you infer as to the climate in regions where lakes with no outlets exist? See pp. 288 (foot), and 289 (top), 250 (foot), 297 (towards foot), 350, 351, etc.

30. Following the rule of Note 1, on p. 73, where must irrigation be used to insure satisfactory crops. See p. 72 (*n.* 2 and 7), p. 73 (*n.* 4 and 5), p. 75 (*n.* 2), and consider what is said on p. 75 (fine print, near top). Comp. p. 117 (*n.* 4, 6), p. 120 (*n.* 1, 3, 5, 8), p. 121 (*n.* 1, 4). And comp. pp. 184 (near foot), 264 (near top), 293 (foot), 302 (foot), 358 (near top), etc.

31. How do mountains extending east and west affect climate differently from a north and south range? See pp. 75, 77, and Question No. 276.

32. What American city has its climate modified by mountains to its north, and to what European cities is it comparable as a resort? See pp. 157 (near top), 213 (middle.)

33. What effect does the absence of an east and west range in North America have on its distribution of vegetation? See p. 77 (last part of first paragraph), p. 78 (second paragraph). Comp. pp. 121, 122, 124, and consult Commercial Map.

34. What are some of the native cultivated plants of America? See p. 78.

35. Which cultivated plants have been imported? Comp. p. 78 and pp. 121–5.

36. What has been the history of domestic animals in America? See pp. 65 (near foot), 67 (top), 78 (foot and *n.* 7), 80.

37. Explain the distribution of animal life in North America as determined by climate and vegetation. What changes has the settlement of the continent made in the distribution? See pp. 78, 77, 57, 58, 59 (top), 78 (*n.* 6), 80 (top).

38. How does the most densely populated part of temperate North America compare in latitude and occupations with the densest populations of Europe? See pp. 81, 144 (middle), 370, 222, 216, 191.

39. How does the density of population of North America compare with the capacity of the continent to support life? See p. 81, and *n.* 8.

40. What was the inducement that led the first Spanish adventurers to the conquest of America? See p. 80 (last paragraph), and compare p. 67.

41. Mention other instances where the same inducement has caused the rapid settlement of a new region. See pp. 92, 126, 354.

42. What has been the general distribution of the American inhabitants of Old World origin? How can you account for this distribution? See pp. 80 (last paragraph), 81, 82, 87, 135–6, 167.

43. Which form of government is most prevalent in North America? See p. 83. Compare with South America, pp. 172–180.

44. In what parts of America are languages spoken which are derived from the Latin? What are those languages? See pp. 81 (*n.* 9), 87 (top), 172 (middle), 158 (below middle).

45. What European mountain system resembles the Appalachians in form and direction? See pp. 107, 285.

46. Compare the lake system of North America with those of Europe and Asia, considering relative size, situation, mutual communication, and drainage. See pp. 115, 184, 250, 259, 237, 269, 289, and consult Atlas.

47. Compare the climate of the places mentioned on p. 93 as belonging to lats. 45° and 38° respectively, and explain the differences. As to the places mentioned in lat. 45°, see pp. 71–7, and p. 51 (near the bottom), 90, 272, 184–5. As to those in lat. 38°, see pp. 329, 94, 184, 276.

48. Mention any parts of Europe or Asia besides that mentioned on p. 75 in which a lowering of temperature is due to the same cause as in the southern parts of the United States. See pp. 184, 279, 304.

CANADA AND NEWFOUNDLAND.

49. Is there any important centre of population in the Dominion of Canada in as high a latitude as any part of England? If so, state where that centre is, and explain why the most populous part of the Dominion is situated in a lower latitude. Why does the part of Asia that corresponds to the more populous region of the Dominion of Canada lie in a lower latitude still? See p. 189, and comp. pp. 88, 90, 289, 72, 84 (near the bottom).

50. What is the nature of the climate of that part of British North America which is directly opposite the British Isles, and what is the reason of the difference? See Map, and in text-book, p. 71 (foot), and p. 88, comparing pp. 47 (near the bottom), 51, and 190.

51. Mention parts of Europe where the rivers are largely used for the same purpose as that to which they are stated on pp. 85, 108, to be applied in the Dominion of Canada and in the United States, and distinguish the cases in which navigable and those in which non-navigable rivers are used for the purpose. See pp. 217, 235, 257.

52. Mention the chief circumstances, whether in the nature of physical conditions or of another kind, that have helped to promote the rapid development of the agricultural region of Canada and the United States as compared with the slow process by which Britain and Central Europe were made habitable in ancient times. See pp. 85, 111 (comparing pp. 223 (second paragraph), 82 (near top), and last paragraph on p. 60.

53. From the nature of the climate of British North America, what drawback must there be to the system of waterways described on pp. 85, 86? See pp. 85, 86, 88 (4), 90 (5), 249 (end of first paragraph of small type).

54. What reason can you suggest explaining why it would be less difficult to operate a railway from Sudbury to Regina to the south of Lake Superior rather than to its north? See Map and p. 85 (near foot).

55. In what respect do the northern rivers of Canada agree with those of Siberia, and in what respect do they differ? See pp. 71, 85, 86, 292 (near foot).

56. Mention the parts of the Canadian Dominion that are richest in useful minerals, and state the nature of the minerals in each case. See pp. 85, 88, 92.

57. What explains the present prosperity of Montreal as compared with Quebec? Can you mention any Asiatic town far in the interior that owes its prosperity to the same cause as Montreal? See p. 88, and comp. pp. 61 (1) (*b*) and 326 (near the bottom).

58. In what way does the situation of Montreal in winter correspond

to Yakutsk, and in its case what water answers to the Okhotsk Sea? See pp. 293, 90 (top), and consult Maps.

59. What gives importance to the site of Winnipeg? Mention any European towns that have a similar situation. See pp. 90, 85, 86, and comp. p. 61 (2) (*a*), and see Questions 589, 706.

60. Mention and explain the points of correspondence between Newfoundland and Yezo. Note also the differences. See p. 92, and comp. the passages referred to in Notes 3 and 4 on that page.

61. Point out any resemblances of position, climate, or resources between British Columbia and the British Isles. See Maps and pp. 47, 51, 72, 90 (7), 190, 191.

62. Mention any waters noted for cod like the Banks of Newfoundland. See pp. 92, 162, 259, ii., and comp. p. 72.

63. In what part of Europe are the Newfoundland fishermen likely to find the chief market in that continent for their fish? See p. 92, and comp. p. 259 (*n.* 4).

64. What Canadian city owes its settlement both to commercial and military advantages? Which of these have passed away? See pp. 88, 89.

UNITED STATES.

65. From what causes are the different climates of the places along the 41st parallel mentioned on p. 93 to be explained? See Maps and pp. 329, 72, 71, 75, 184, 294, 293, 289.

66. What commercial advantage has the United States in its position? See p. 93 and compare p. 192 (last paragraph) and 193 (top).

67. Of what advantage is it that the boundaries that are artificial pass through thinly peopled areas? See pp. 93, 96 (foot), 220 (*n.* 1) (and above middle), 224 (*n.* 1), 221 (2, last sentence), 211 (4).

68. Are the boundaries between the various States more frequently artificial or natural? Which would indicate greater unity among the States? See map and consider what is said on page 281, coarse print.

69. What advantages for commerce has the Pacific Coast, and to what is due the importance of San Diego Bay? See p. 94.

70. What disadvantage for ocean commerce has San Francisco in comparison with Puget Sound or Vancouver, B.C.? To answer this, measure on a globe the relative distances to Yokohama or Hong Kong.

71. Judging from the character of the Pacific and Atlantic coasts, what do you expect as to the depth of the adjoining coast-waters? See pp. 94, 95, and consult Atlas.

72. How do the harbors of the Gulf of Mexico and the Atlantic coast

southward from Chesapeake Bay compare in utility with those of the Pacific coast? On what coast of Europe are similar conditions present? See pp. 95, 94, 225 (1), 260 (middle).

73. What is the most important harbor on the southeastern coast and to what is its excellence due? See pp. 95 (*n.* 2), 156.

74. Why is New York Bay so important a harbor? See pp. 96, 146, 145 (under Boston), 136 (middle).

75. Where else in Europe besides Britain are there important seaports on river estuaries like those of the eastern part of North America? Mention some of the chief American seaports referred to. See pp. 210, 211, 218, 219, 225, 226, 265. See also Atlas.

76. Where does the sandy formation of the eastern coast appear northward of New York Bay? See p. 96.

77. For what purpose are the sandy coasts employed? See p. 96.

78. With what coasts is that of Maine to be compared? See pp. 96, 94, 69 (above middle), 262 (near top).

79. What industry is encouraged by such coasts? See p. 96.

80. What American port is favored commercially by the severity of the Canadian winters? See pp. 90 (near top), 96.

81. How do the eastern and the western halves of the United States differ in surface, climate, and resources and in the resulting occupations? See pp. 97, 73 (*n.* 4), 80 (near bottom), 143–4.

82. What conditions have favored the formation of one nation instead of several in the area occupied by the United States? Consider the descriptions of the surface. Compare pp. 82, 109, 114 (foot), 115 (middle), 117, 132.

83. How does the Western Highland compare in general elevation with the Appalachian Mountains? See p. 97 (1).

84. What is the character of the Cordilleras in North America? See p. 98 (top).

85. What difference in the arrangement of the ranges is there in the northern and in the southern sections of the Rockies in the United States? See p. 98.

86. Why should a passenger on the Central Pacific Railroad see but little of the Rocky Mountains? See p. 99 (foot), 100 (top), and consult Map.

87. In which section are the valleys more suitable for farming? See p. 99 (and *n.* 1), 100 (and *n.* 1), and compare p. 70 (fine print near middle of page).

88. How can you account for the fact that so many large streams have their origin in the Rockies when there is so arid a region to the west? See pp. 99, 100, 101, 73 (middle), 52 (3) (a).

89. In what way do the facts referred to in the previous question allow a comparison to be made between the Colorado and the Nile?

See p. 117 (*n.* 1). What great contrast is there between the outlets of the two streams? See Maps.

90. Into what three sections may the great Plateau Belt be subdivided? See p. 101–102.

91. Which of these contains extensive lava beds; which is especially characterized by salt and alkaline deposits; and in which do cañons abound? See p. 101–2, and consult Geological Map.

92. In what way does Salt Lake City bear a resemblance to Damascus? See pp. 159, 299, 61 (3) (*c*).

93. How do you account for the extensive cañons of the Colorado? See pp. 102–3 (3), 28, 119. What supposition is necessary to explain the cañons in the Uintah Mountains? See pp. 102 (*n.* 4), 103 (*n.* 2).

94. What other evidence of volcanic action is to be found in the Pacific Highlands than lava beds? See pp. 99, 103, 104 (and *n.* 1), 161 (foot), 162 (below middle).

95. Of what forces do we find the results of the long-continued action in the Plateau Belt? Explain the manner of their action and mention some of the results. See pp. 100–103. Comp. p. 328.

96. In what part of the United States is there land below the level of the sea? Can you mention other instances elsewhere? See pp. 102 (end of second paragraph), 249 (near top), 299, 338 (middle).

97. Why are such depressions not filled with water by the streams entering them? See p. 100 (near foot).

98. In what way is the situation of the Pueblos and Moquis in the United States like that of the Basques in Spain? How does the land they inhabit resemble the last stronghold of the ancient Britons? See pp. 103, 188, 195, 267.

99. What causes have decided the location of the modern towns in the Highland area? See p. 159 (5).

100. Describe the course of the Colorado River from its headwaters in the Wind River Mountains to the Gulf of California. See Map and pp. 71, 103, 120.

101. Why should such names as are given on p. 103 (*n.* 2, 3, 4) be applicable to Cañons? Comp. p. 102 (3).

102. By what railroad is some of this scenery made accessible? See p. 103 (top). Contrast this road to the road mentioned on p. 239.

103. What three lowland areas lie west of the Cascade and Sierra Nevada range? How does their combined areas compare with the low and area east of the Rocky Mountains? See pp. 104, 97 (fine print).

104. In what respect is Sacramento like Magdeburg? How do they differ with respect to cause of earliest settlement? See pp. 159, 227. How does the use made of the wind near Stockton differ from that in the Netherlands? See pp. 160, 217. Make a full comparison between Los Angeles and Florence. See pp. 160, 275.

105. What part of the United States has a winter season like that of Japan? See pp. 330, 122 (fine print), and see Commercial Map.

106. At what places do streams escape from the plateau east of the Sierra Nevada and reach the Pacific? See p. 105 (top), and consult Map.

107. On account of what depression was a cession of land obtained from Mexico and of what advantage is that valley? See pp. 100 (near middle and *n.* 5), 95 (near top), 94 (bottom).

108. Through what steps is the depression occupied by the Columbia being made more serviceable? See p. 120 (middle).

109. What English seaport has a situation like that of Portland, Or.? See pp, 161, 202 (line 14), and comp. Maps.

110. How does the depression at San Francisco affect the climate to its east? With what depression in India does it compare in this and in another respect? See p. 94 (3, and *n.* 2), 308 (foot), 307 (below middle).

111. Compare San Francisco with New York in commercial position, not only as to harbor, but inland connections, and nearness to great foreign markets. See pp. 160, 146.

112. To what cause is the long slope of the Great Plains east of the Rockies probably due? See pp. 106, 73 (*n.* 4), 25 (middle), and consult Profile D, pp. 62, 63.

113. What formations vary the uniformity of the slope? See p. 106 (fine print), and consult Map. See also pp. 29 and 25 (bottom), for explanations of formations.

114. To what part of Europe are the Great Plains comparable, both in uniformity of surface, navigability of rivers, dryness of climate, crops, and occupation of inhabitants. See pp. 106, 97, 252 (5), 251 (upper third of page), 249 (rivers).

115. Where is there a formation of soil continuous from the Mississippi Basin to the Atlantic Slope? See pp. 107, 112, and consult Geological Map.

116. How does this formation compare in age with that adjoining Hudson Bay? See p. 70.

117. What lakes in Italy occupy basins similar to those of the lakes of Central New York. See pp. 110 and 269, and consult Maps.

118. In what way is Auburn, N. Y., similar to Geneva and Zürich in Switzerland? See pp. 148, 238.

119. How can you account for the existence of the numerous small lakes of the regions mentioned on p. 111. See p. 31, and consult Geological Map.

120. In what other parts of the world are there large areas of extremely rich soil, as in the American prairies? What are the chief crops grown on each? See pp. 111, 122, 251 (4), 292 (above middle), 308 (top), 324 (3).

121. How has the nature of the prairie lands facilitated their rapi-

settlement and in what way has this influenced the growth of towns. See pp. 60, 111, 132 (fine print), 152 (near top), 155 (middle).

122. To which of the five zones of production in Russia can you find parallels in America? Which fall within the United States? See p. 251, 77–8, 111, 121–2, 130, 151–2.

123. How do you explain the bayous of the Mississippi? See pp. 112 and 28.

124. What circumstance favors the location of Baton Rouge, Natchez, Vicksburg, and Memphis? Why are all these towns on the east bank? See pp. 112, 61 (2), 154 (coarse print).

125. Along what great European river does a similar cause determine the location of towns? See p. 283 (2).

126. Describe the similarity in arrangement of the chains and groups of the Appalachian system as compared with the Rockies. See pp. 107, 98.

127. To what European system is the Appalachian similar in structure? See p. 235 (middle paragraph), and consult Maps.

128. Show how the construction of railroads and canals has been influenced: 1, by the mountains and valleys; 2, by harbors; 3, by prairies. See pp. 133–4, 109, and Maps.

129. Compare the utility of the flooded part of the Mississippi Valley and its delta with that of the Nile. How do you explain any contrast? See pp. 112, 118, 335.

130. Why does the Mississippi not rise so much in the Passes as at Vicksburg? See p. 118 (foot).

131. From what various sources have the inhabitants of the United States been supplied with fuel? See pp. 110 (fine print), 129 (top and middle), 130 (fifth and sixth paragraphs), 122 (near foot).

132. How can you account for the fact that coal from Australia is brought to San Francisco? See pp. 130 (5th paragraph), 356 (under Newcastle), 125 (under Forest Products).

133. Explain the occurrence of so many extensive swamps along the Atlantic coast. See pp. 112, 33 (second paragraph), 69 (*n.* 5).

134. Why should the swamp-belt be unhealthful, and by what means might it be redeemed? See pp. 57, 215. What crop flourishes upon such land if properly prepared? See pp. 112, 272 (end of coarse print), 320, 357 (under *c*).

135. How do the resources of the sandy plain bordering the Appalachians promote the prosperity of Pensacola? See pp. 112–13, 125 (foot).

136. What are the various circumstances that account for the existence of the series of towns from Montgomery, Ala., to Trenton, N. J.? See pp. 113, 61 (1) (*c*), (2) (*d*), and consult Geological Map.

137. How is the difference between the soil of the New England

States and that of the Southern uplands to be accounted for? What other regions have been similarly affected? See pp. 114 (top and *n.* 1), and consult Geological Map.

138. Explain the importance of the rivers of the Atlantic system. In what way can their usefulness be compared with that of other systems? See pp. 114 (middle), 134 (first paragraph in coarse print).

139. How does the commercial importance of the Mississippi system compare with that of the St. Lawrence? What competitors has each? See pp. 134, 115–20, 150 (coarse print), 152 (coarse print), 153–4 (coarse print), 133.

140. To what important European city is Detroit similar in its situation? Explain the similarity? Why will Detroit not be likely to equal C. in importance? See pp. 153, 281.

141. What similarity in point of utility is there between the Hudson-Mohawk Valley and the depression containing the Bay of San Francisco? See Maps and pp. 94 (3), 114.

142. To what important channels of communications in Europe and in Asia is the Hudson-Mohawk depression comparable? See pp. 114 (foot), 146, 239 (foot), 240 (top), 297 (middle), 328 (middle).

143. What rivers cross ranges of the Appalachians? In what way have these cross-valleys of the Appalachians been utilized? In what part of Africa have such valleys served a similar purpose? See pp. 108–9 (2), 342 (top and bottom).

144. In what parts of the United States are the streams chiefly valuable for irrigation only? See pp. 117 (fine print), 120, 121 (*n.* 4).

145. Why has the Colorado its tributaries from the east rather than from the west? See p. 52 (3, *a*).

146. What difficulties lie in the way of irrigation in the Colorado Basin? See pp. 102 (3), 120.

147. Why would the Colorado be of little use for navigation, even without rapids? See pp. 102 (3), 120, and comp. pictures on pp. 118, 119.

148. Explain the differences in amount of rainfall received by the various river basins. See pp. 117, 120, 121. Consult pp. 51, 72–5 and Rainfall Map.

149. What rivers of the United States have had their channels deepened at the mouth by means of jetties? See pp. 95 (foot), 120.

150. What American rivers are prevented by cascades from serving as easy means of communication with the interior? See p. 71. Comp. p. 332.

151. Why should the great agricultural area of the United States be in the eastern part? How does it compare in size with the western area and with other agricultural areas of the world? See pp. 121, 75 (first paragraph of coarse print).

152. What difference is there in the season of rainfall of the eastern and of the western agricultural areas of the United States? How do they compare in amounts? See Map of Currents, Periodical Rains, and Drainage and Rainfall Map.

153. What summer temperature and average yearly rainfall does the region have in which cotton grows? also corn? also wheat and oats? See pp. 121–2. Consult Commercial Map for location of areas, and the Rainfall and Isothermal Maps for other data.

154. Which crops show the greatest range in latitude?

155. How does the time of chief rainfall of the eastern agricultural area differ from that of the western area? See Map of Periodical Rains.

156. What difference in the seeding and harvest times of the two areas results? See p. 122 (fine print).

157. What products of the United States are of the greatest value? What industry employs the largest number of Americans? See p. 127, and comp. totals on p. 142.

158. Explain how any industries of the cities named at foot of p. 122 depend upon the corn crop. Comp. pp. 151, 153, 155.

159. What other crops are also drawn upon to the same effect? See Commercial Map.

160. What Russian seaport on the Black Sea is similar to Chicago in position, and in its leading industry? See pp. 254 (below middle), 252, and consult Map.

161. What likeness is there in position and industry between Indianapolis and Kishinef? See pp. 151, 255.

162. Why should woollen and cotton manufactures be mostly made in the New England States and not so much in the States producing the wool and cotton, while flour is so largely manufactured near the centre of the wheat region? See pp. 123, 124, 131 (middle), 144 (1). Consider the nature of these industries, and the source of greatest supply of labor. See Commercial and Population Maps.

163. Are butter and cheese made in the region of the crop on which they indirectly depend or at a distance? See p. 123.

164. To what English and German towns are Lowell, Lawrence, and Manchester similar in their industries? See pp. 202 (2), 203, 222.

165. How does the distribution of draught animals in America compare with that of Europe? See pp. 123 (middle), 187 (middle). Comp. also p. 324 (2).

166. What American town has an industry similar to Lyons and Valencia? See pp. 149 (middle), 208, 266.

167. In what other products than wheat does America find competitors in the world's markets? See pp. 123, 124 (top), 311, 335 (foot), 125 (top), 297 (near foot), 130 (foot).

168. How does the absence of a great east and west range of moun-

tains in the United States affect the labor necessary to cotton growing? See pp. 75 (3), 77 (near top), and consult Map on Equal Annual Range of Temperature.

169. What are the various sources of the sugar used in United States? Why can it be more profitable to import cane sugar from Cuba than to grow it? See p. 124. Consult Commercial and Isothermal Maps.

170. Judging by the climate of the regions growing sugar-beet, what parts of the United States would you consider capable of producing that crop? See pp. 208, 227.

171. Explain how the climate of the regions named on p. 124 as producing wine is rendered mild enough for the vine. See pp. 116, 77 (middle). Comp. also p. 208 on wine, and note the July isotherms of France and America on Isothermal Map.

172. In what respect is Connecticut tobacco culture like English grain growing? See pp. 125, 113 (fine print), 190 (foot).

173. What European countries have a large lumber output? How does the timber cut resemble that of Michigan and other lumber States? See pp. 257, 251 (2), 125.

174. Why should the countries named on p. 125 (middle) be better supplied with forests than the other European countries? Consider surface, climate, density of population, and condition and character of industries practiced. Consult p. 58 and p. 59 (near foot).

175. What are some of the various kinds of trees that are made use of in America? How do their uses differ? See pp. 76, 78, 85, 108, 110, 113, 125.

176. What connection is there between the prosperity of Lynn and a forest product of the Northeastern States? See pp. 145 (near top), 125 (and *n.* 1).

177. How is the production of salt in Michigan aided by the lumber industry? See p. 131.

178. What European country corresponds to Maine in various industries, particularly ship-building? How do the coasts and other surface features compare also? See pp. 96 (middle), 108, 80 (second paragraph) 257, and consult Commercial Map.

179. What change has taken place in the relative importance of California's products since 1860? In what way has a similar change occurred in Australia? See pp. 126, 354.

180. Is such a change conducive to permanent prosperity? To help in your answer compare the populations in 1880 and 1890 of California and of Nevada, as given on p. 142.

181. On what industrial basis are the oldest and most populous countries of the world principally established? See pp. 59 (on Man), 309, 324 (3).

182. In what way is iron-making particularly favored in the Appa-

lachian region? What Northern and what Southern city lead in this industry, and what special advantage has each? See pp. 128, 129 (fine print near foot).

183. To what English and Belgian towns does Pittsburg bear resemblance? What advantage has Pittsburg in fuel? See pp. 129, 208, 219. What Bohemian industry is carried on in Pittsburg? See pp. 244–5.

184. What natural route of transportation is of valuable aid to the ore beds of Northern Michigan and how does Cleveland, O., profit by its position on this route? See pp. 128 (foot), 129 (top), 150 (foot).

185. What other country has coal-fields that may be compared in extent with those of the United States? See pp. 129 (and *n.* 1), 130, and comp. p. 326 (first paragraph in small type).

186. What are the natural outlets provided for the chief coal and iron centres of the United States? See pp. 128, 129, 130, and comp. pp. 114–20. Consult Map.

187. At what disadvantage for export trade does the geographical location of the iron-making centres place that industry? See Industrial and Commercial Maps, and compare what is said on p. 191 about the location of the coal and iron mines of England.

188. What French city has manufactures like the chief Connecticut towns? See pp. 145, 208. How are the Connecticut towns supplied with fuel and raw materials?

189. Compare the Industrial and Commercial Maps with the Geological, and ascertain to what ages the iron and the coal petroleum bearing strata belong. Read also pp. 33–4 on Emergence of Marine Deposits.

190. By what routes does anthracite coal most easily reach the colder parts of the United States? See p. 129 (foot), Map of January Isotherms, and the Map of the Northeast Section.

191. What return cargoes can lake shipping secure from these points: Duluth, Marquette, Muskegon, Saginaw, Chicago, Toledo? See Political and Commercial Maps and pp. 150–53.

192. What great bridge was built to facilitate the eastern shipment of coal, and with what other coal mines does this bridge facilitate competition? See pp. 130 (top), 87 (1).

193. In what parts of the United States is salt obtained in the same way as in Italy, 270 (near top), 131.

194. Why should the amount of water-power used east of the Alleghanies exceed that used to their west, and on which part of the Pacific Slope must steam-power be most largely employed? Consider in your answer surface features, climatic differences, and abundance of coal.

195. What manufactures are made from raw materials produced in

the country and which contain materials brought in part or wholly from other lands ? See pp. 131, 127.

196. To what extent does the geographical location of the ten leading manufacturing cities account for the kind of products of which they have the greatest output ? Take each separately. See pp. 131–2 and consult Commercial and Industrial Maps.

197. What very different factor in manufacturing has given aid to Swiss industry ? See p. 238 (fine print), 237.

198. In what States are hard woods still obtainable in such quantities as to make furniture and agricultural implements prominent manufactures ? What other aids are present in each case ? See pp. 151, 152, 153, 154, 157, 161.

199. Explain the lack of manufacturing in New Orleans. See p. 158. Why should coffee be a leading import at New Orleans, Galveston, and Mobile ? See Commercial Map.

200. How has the construction of railroads changed the character of crops raised in Eastern localities, and how is Western and Southern agriculture affected ? See p. 133.

201. (*a*) What circumstances explain the rapid rise of Chicago ? (*b*) What difference would you expect to find between the trade of Chicago and that of Buffalo, considering their different situation ? (*a*) See p. 151, and comp. pp. 148 (near foot and *n.* 2). (*b*) See pp. 148–4, and consult Map.

202. In what respect does the site of St. Louis correspond to that of Montreal ? Can you mention any European town that may be compared to these two for the same reason ? See pp. 154–5, 88, 247, 272, and 61 (2) (*c*).

203. What reasons can you give for the different amounts and importance of the traffic on the Great Lakes, the Atlantic coast waters, the Mississippi system, and the Pacific coast waters. See p. 134 (first paragraph of coarse print) and consult Commercial and Industrial Maps.

204. How does the United States compare with other countries with respect to relative and absolute amount of goods exported ? What does a relatively small proportion of exports indicate as to the diversity of American industries ? See p. 134 (middle).

205. Why should so much of our trade be with Great Britain ? In your answer consider the kinds of goods of which each country has a surplus for exportation. See pp. 134, 15, 191, 192 (last paragraph).

206. What industry produces the bulk of the goods exported by means of which the American supply of foreign commodities is obtained ? See p. 134.

207. Of what peoples, and pre-eminently of what one people, were the original European settlers of the United States ? See pp. 135, 81–2.

208. Why should negroes have been extensively introduced into the

Southern States and not into those of the North? See pp. 137–44, and comp. pp. 57, 299 (near the top), 314 (top), etc.

209. Account for the various other elements in the population that have come to America since 1840. What is the proportionate number of foreign-born compared to the main body of the population? See p. 136.

210. In what way is the distribution of the foreign element influenced and what is their general distribution among the States and in the occupations? See pp. 136–7, 144.

211. In which group of States is there the densest population? See pp. 140–42. Divide the totals of population in 1890 by the totals for area. What single State has the densest population?

212. In which group is the ratio of farm lands to total area the greatest? See pp. 140–42. Compare totals of area and total of farm land.

213. Account for the large proportion of farming land in Illinois, 50,628 square miles out of total area of 56,650 square miles, and for the smaller proportion in Maine, Minnesota, Florida, Texas, and the Cordilleran group in general. See Physical Maps and compare accounts of surface and climate, and see pp. 140–42.

214. What group of States had the greatest proportionate increase of population in the last decade? What one State lost in population? What one is stationary? What State shows greatest relative gain? Account for these facts. See pp. 140–42.

215. Between what States have physical features been made the boundary? How do the American boundaries compare in this respect with the boundaries between European and Asiatic countries? See Maps.

216. In which group is there the largest number of towns of 4,000 or more inhabitants? In what industry is the largest number of inhabitants of these States engaged? See pp. 140–42.

217. What industries are pre-eminent in the States of fewer towns? How would you explain the fact that while in Rhode Island two-thirds of the areas are farm lands, yet the farming population is but one-sixth as numerous as the manufacturing? See p. 140.

218. Explain the extremely scanty population of the Plateau States? See pp. 142–3. What is the average size of all the States of the Union? Can you give any reasons for wide deviations from the average? See pp. 140–42 and comp. 237 (foot).

219. Why should Key West be specially engaged in the tobacco industry? See p. 157 and Commercial Map. What circumstances favor the building of iron ships at Chester? See p. 150.

220. What American city has protection from floods by permanent banks as have the cities of Antwerp and Rotterdam? See pp. 158, 215 (foot).

221. What reasons can you give for the growth of so many large cities on the Atlantic seaboard? Take each case separately, considering facilities, communications, distances, resources, and neighboring occupations? See pp. 145, 146–7, 149, 155, 156.

222. What site at the confluence of two rivers was important enough to lead to the construction of artificial foundations for a city? See p. 152.

223. What city of the United States owes its existence to an inland river and irrigation? See p. 159.

224. What large city near the confluence of two great rivers? See p. 155.

225. What cities have been built up through the aid of great falls? See pp. 154, 120 and 161, 148 (near foot), 144.

226. What important seaport not on the coast? Why is there no town between this seaport and the sea? See p. 158.

227. What reason is there why Oswego does not receive so much lake traffic as Buffalo, although it is a lake port and with even a shorter canal route to the Hudson? See p. 116 (fine print), 115, and see Map for differences in level between the lakes.

228. What capital cities are not near the centre of their States? Explain any historical or other reasons for their position? Consult Map and consider the distribution of the resources and industries of each State? See also p. 145.

229. In what part of the United States are the names given by Europeans? How do you account, *e.g.*, for San Francisco, Florida, Los Angeles, Santa Fé, St. Augustine, San Antonio? See pp. 77, 82, 160. What trait of character in their givers do these names evidence?

230. What do the names New Orleans and Baton Rouge indicate? See p. 158. Terre Haute?

231. To what influence are St. Lawrence, Champlain, Louisiana, Marquette, and St. Louis due? See p. 155. Explain the appropriateness of Vermont and Detroit.

232. What people gave such names as Hudson, Yonkers, Orange, Rhode Island, Staten Island? See p. 82.

233. To what influence would you ascribe St. Paul, on Kodiak Island? See p. 162.

234. From what source are taken such names as Mohawk, Oneida, Ontario, Onondaga, Cayuga, Illinois, Massachusetts, Mississippi, Ottawa, Saskatchewan, Natchez, Kansas, Shoshone, etc.? See p. 146 (first part of coarse print).

235. Explain Philadelphia, Pennsylvania, New York, Boston, Albany, Virginia, Baltimore, Rochester, New Haven, Providence, Cleveland, Pittsburg, Jersey City, Washington, Richmond, Charleston. Consult your history of United States.

236. Mention State names showing English, Spanish, French, Dutch, Indian, and American influence (one of each). Mention likewise six cities, six rivers. From what source are most river and mountain names taken?

237. What bay bears a name given by Portuguese? See p. 88 (3). What town has a German name? See p. 154 (near foot).

238. Why should so many names have the prefix *New*?

239. Find cities in America to illustrate the principles laid down on pp. 61, 62.

MIDDLE AMERICA.

240. What indication of the climate of Mexico is furnished by its products? See p. 164, and compare pp. 185, 187, 320–21.

241. Contrast the most populous part of Mexico with the nearest populous part of the United States as regards surface, population, and products. Consult Map, and see pp. 164–6, 148.

242. Where else in the world is there so elevated an area of cultivated land as in Mexico? Compare the two regions as to latitude and products and explain how each is enabled to sustain agriculture? See pp. 164, 324 (3), 325 (4), 71, 72 (*n.* 7), 73 (*n.* 1).

243. To what does Belize owe its importance? See p. 166 (5).

244. What inter-oceanic canal is being constructed in Central America? What natural advantages are being utilized for the purpose? See p. 166 (5). How would the completion of this canal affect commerce, *e.g.*, between Boston and Santiago? Yokohama and London? New York and San Francisco? See Map and Globe.

245. Compare the West Indies with the Eastern Archipelago as to extent, character of surface, inhabitants, government, the nature of the chief food-plants and plantation products. See pp. 166–8 and 318–21.

246. Why is the British use of the terms Windward and Leeward Islands inappropriate? What other uses of the terms are there, and what better justification is there for these? See p. 168 (*n.* 2) and comp. p. 39. Consult Map.

See also Questions 107, 169, 199, 219, 248, 259, 264, 741, 774, 798, 823, 834.

SOUTH AMERICA.

247. Contrast the Andes with the Rocky Mountains. See pp. 98–100 and 170.

248. Why is the Amazon at present and why is it likely to remain commercially of less value than the Mississippi? See pp. 171–4, 57 (under Salubrity), 59, 110, 116–20. Consult Atlas and table on p. 370.

249. Describe and explain the contrasts of climate and vegetation in South America on different sides of the Andes to the south of lat. 4° S. See p. 171, and comp. pp. 51 (bottom, along with Question 697), and 52 (3) (*a*).

250. Mention all the circumstances favoring the supply of the great amount of water carried by the Amazon. See Map and pp. 22 (middle), 49 (last paragraph), 40 (middle), 51 (*b*), 52 (3 *a*).

251. Can you mention any other part of the world besides the coast strip referred to on p. 171 where a cold current has the effect of diminishing the rainfall and helping to create a desert? See p. 333 (small type) and above Question 711.

252. Why should the prevailing winds on the west side of the Andes in the southern part of South America be northwesterly? To what winds of the northern hemisphere do these winds correspond? See p. 171, and comp. p. 41.

253. Can you mention any peculiarity of South American monkeys as compared with those of other parts of the world? See p. 172, and comp. p. 334.

SOUTH AMERICAN COUNTRIES.

254. What part of Brazil is most favorable for settlement by Europeans? Why is it so? See p. 174, and comp. pp. 57 (middle) and 52 (3) (*b*).

255. What is the general character of the Brazilian coast-line, and how is that character explained? Can you give any other examples of a similar coast-line due to a similar cause? See p. 174, and comp. p. 48 (end of second complete paragraph).

256. What important seaport on the west coast of America has a natural harbor resembling that of Rio de Janeiro as regards its capacity and its land-locked character? See pp. 94, 160 and 174, and consult Atlas.

257. In what parts of Asia is the staple export product the same as in Brazil and Venezuela? See pp. 174-6, and comp. 316, 321.

258. Mention the chief seaports between which the route will be greatly shortened by the completion of the Panama ship canal. State whether the canal is likely to have as great an immediate effect on the commerce of the world as the Suez Canal, and give your reasons for your answer. See p. 176, consult Map, and consider the distribution of population in the countries affected and the nature of their products.

259. What valley in North America would you infer from the nature of the products to have a similar climate to the more populous part of Chile? See pp. 177–8, and comp. pp. 104, 123, 124.

260. What reason's have you for believing that the distribution of the rainfall as regards the time of year when it chiefly takes place must also be similar in these parts? See also p. 51 (end of first paragraph under Effects of Marine Currents), and Question 252, with the references there given.

261. Why should the estuary of La Plata silt up with such peculiar rapidity? See p. 178, comp. p. 27 (end of first complete paragraph), and consult Map.

262. In what respects does the estuary of La Plata agree with, and in what does it differ from, the Solway Firth? Compare the two estuaries as to length and width. See p. 178, comp. p. 89, and consult the Atlas, making use of scale and compasses.

263. Mention any facts that show the less favorable character of the climate in the southern parts of South America (with the adjacent islands) than in the corresponding latitudes of Europe. See pp. 171, 178, 180 (bottom), and comp. pp. 185–6.

264. Mention all the American states in which the great majority or a large proportion of the population is found at a higher level than 5,000 feet; indicate roughly in each case the height at which the people live, and compare the height of these table-lands with that of the more populous table-lands of Europe. See pp. 164, 175, 176, 177, and pp. 212, 220–21, 235, 239.

265. How do you explain the existence of a desert in Patagonia? In what way does the cause of it differ from the cause of the Kalahari desert? See pp. 178, 52 (3, *a*), 333.

266. Mention the chief wheat-exporting states of South America. Which of these is most favorably situated for commerce in wheat? Consider in your answer the situation of the countries where there is most need for surplus wheat. See pp. 177–8, and comp. the paragraph on pp. 60–61, and also pp. 191, 123.

267. In what parts of the Argentine Confederation is the population increasing most rapidly? Why should this be so? From what part of

the world do immigrants into this region chiefly come? See p. 178, comp. pp. 171 and 187 (near the bottom), and consult Map.

See also Questions 17, 18, 19, 43, 44, 733, 818.

EUROPE.

268. Why is it difficult to draw a precise boundary between Europe and Asia? See p. 181, and comp. the account of the Ural Mountains, p. 248, and of the Russian steppes, p. 252.

269. What advantages for marine commerce does Europe derive from its outline and its river system? See pp. 181, 183–4.

270. Why should the climate of Iceland and the Faroe Islands resemble that of Europe more than that of the adjacent parts of America? See p. 182, and comp. p. 47.

271. Mention the chief points of contrast between the Mediterranean Sea and the Baltic. See pp. 182–3.

272. Why should evaporation be rapid in the Mediterranean and slow in the Baltic? Comp. what is said regarding the effect of the altitude of the sun on pp. 21–2, about evaporation on p. 49, about the character of the Mediterranean summer on p. 184, and on the effect of clouds on p. 51 (paragraph 2).

273. If the present level of land and adjacent sea were raised 600 feet, where would the boundary of Europe be drawn? On what grounds might this be considered the permanent boundary of the continent? See p. 182, and comp. p. 25 (near the top).

274. Contrast the basins of the two largest rivers of Europe. See p. 183, and consult Atlas.

275. What are the canals and rivers by means of which the Mediterranean is brought into connection with the German Ocean and the Atlantic? See pp. 184, 206–7.

276. What important effect have the mountains of Central Europe on the climate of the Mediterranean peninsulas? How do they produce that effect? See p. 184, and comp. what is said on p. 50 as to winds as carriers of temperature, and on p. 52, paragraph (3) (*a*), as to the effect of mountains.

277. How does the Mediterranean assist in mitigating the extremes of temperature in the countries which border upon it? See p. 184, and comp. p. 50 (1) (*a*), and p. 43 (under Temperature).

278. Why should most of the rivers of the Mediterranean peninsulas be of more use for irrigation than navigation? See p. 184.

279. Why is the olive so important a product in the Mediterranean

peninsulas? How is it specially suited to that region? Mention other plants of the region similarly suited to it. See pp. 184–5.

280. Why should the changes in climate in Central and Northern Europe be greater from west to east than from south to north? See p. 185, and comp. p. 51 (2), and also p. 289 (climate of Asia) and p. 329 (climate of Japan).

281. Why should the waters of the Gulf of Bothnia and the Baltic be more liable to freeze than those of the German Ocean? See p. 186, and comp. p. 57 (near the top).

282. Describe the northern limit of the cultivation of the vine in Europe, and explain why it should take the direction it does. See p. 186.

283. What part of Europe presents the most marked contrast to the Mediterranean region as regards the time of the year when the greatest rainfall occurs? Comp. p. 184 and p. 186 (second paragraph of small type).

284. How does the great heat of summer in Eastern Europe tend to make the rainfall greater than it otherwise would be? See p. 186, and compare the description of the surface of Eastern Europe on pp. 248–9, and what is said regarding evaporation and condensation on pp. 49–50.

285. From what is stated on p. 186 as to the pre-eminence of Europe in the production of manufactured goods, what part of Europe, the east or the west, would you expect to display that pre-eminence in the highest degree, and why? Comp. pp. 251–2.

286. To what causes is the rapid emigration from Europe due? See p. 187, and compare pp. 136 and 354, 87.

287. Why were the Spaniards and Portuguese the chief emigrants from Europe just after the discovery of America, and why are those of Teutonic and Irish race the chief emigrants now? See p. 265 (near the top), pp. 190–91, 193 and 223 (bottom).

288. Give some examples of European people who are now known to speak different languages from those which they once spoke, thus proving that a common language is not in itself a proof of a common origin. See pp. 188, 195, 209–10, 264, 280 (2).

THE BRITISH ISLES.

289. What are the advantages for foreign commerce which Great Britain owes to the form of its coast-line and its geographical situation? See p. 190.

290. When did the advantage due to its geographical situation begin to be felt, and why? See p. 193.

291. How is the advantage due to geographical situation shown by the nature of the foreign commerce? See p. 192.

292. What fact shows the advantage for the commerce which Great Britain derives from her colonies? See p. 193 (top).

293. How do you account for the shipping of the United Kingdom being even more extensive than its commerce? See p. 193, and comp. p. 203 (under Glasgow).

294. Why is it important to possess coal and iron in situations near the sea? See p. 191, and comp. p. 186 (2) and p. 203 (under Glasgow).

295. Why should the western part of Great Britain be much moister than the eastern? See p. 190, and comp. what is said on p. 41 as to the prevalent winds on the west coast of Europe, and on p. 52 (3) (*a*) as to the effect of mountains.

296. What are the principal crops in the different parts of the British Isles, and explain why one crop should be the most important in one part, another in another? See p. 190.

297. Why is Ireland specially rich in pastures? See p. 190.

298. What change has taken place in the distribution of the population of the British Isles since the beginning of the present century, and how is that change accounted for? See p. 193 (second paragraph of small type).

See also Questions 357, 410, 547, 580, 680, 834.

ENGLAND.

299. "The highest mountain ranges in the world are in fact comparatively recent in a geographical sense." Why should this be so? See p. 32 (General Result of the Action of Water).

300. What important port on the Tyne? What seaport not on the Tyne owes its importance to the same cause? See pp. 201 and 202.

301. Why should dredging be necessary to keep the Tyne open for large vessels? See p. 201, and comp. p. 27 (second paragraph).

302. Mention a seaport town which has rapidly grown in importance in recent years owing to the discovery of deposits of iron ore in its neighborhood. See p. 201.

303. Why should the deposits of the Humber (p. 199) and the Thames (p. 199) be laid down on the sides of the estuary and not so much in mid-channel? See p. 44 (near the top), and comp. p. 27 (second paragraph) and p. 53 (near the bottom).

304. What are the principal stretches of flat coast in England and Wales? See p. 199.

305. Why should Hull have such a large trade with the continent of Europe? Consider its position (pp. 201, 199), the course of the Trent, and the situation of the great manufacturing towns mentioned on pp. 202 and 203.

306. Mention the most important circumstances you know that have promoted the growth of London. See pp. 199 and 201, and comp. pp. 60, 61 (1) *b*, and (2) *c*, 62, and 198. Compare also Hull (p. 201) and Question 305.

307. How do you account for the decline of most of the Cinque Ports as seaports? To what does Dover owe its continued importance? See p. 201.

308. Mention the chief natural harbors of the south coast of England, and the particular advantages (if any) belonging to each. See pp. 201–2.

309. To what circumstances does the Isle of Wight owe its mild climate? See p. 196.

310. Why are there no great seaports on the Severn? See p. 199.

311. What circumstances explain the nature of the trade and industry of Bristol? See p. 202.

312. What two Scotch seaports resemble Bristol in their situation and in the nature of their present or former trade and industry? See pp. 203–4.

313. With what English towns may Swansea and Cardiff be compared with regard to the rapidity and the cause of their growth? To what do these towns owe their principal industries? See p. 202, and comp. p. 201.

314. Explain the early importance of Chester, and why it has been outstripped by Liverpool. See p. 202, and comp. p. 61 (1) and (4).

315. Give an account of the growth of Liverpool, explaining why the estuary on which it stands does not appear to have been made use of in early times, and why Liverpool itself rose into importance only after the beginning of last century. See p. 202.

316. How do Bristol and Chester, both originally Roman strongholds, compare as industrial centres? See p. 202, and comp. 61 (4) and (5).

317. Show how the physical features explain to some extent the position of the boundary between England and Scotland. See p. 196, and comp. p. 37.

318. Besides the Cheviot Hills mention some other parts of Great Britain chiefly devoted to sheep, state whether they are hill or plain, and why they are best suited for that purpose. See pp. 198, 199 (second paragraph), 203.

319. Give a general account of the so-called Pennine Chain. See pp. 198–9.

320. Why should the region chiefly engaged in the cotton manufacture in England lie on the west side, that chiefly engaged in the woollen manufacture on the east side of the Pennine Chain? Consider in your answer the present or original sources of the raw material of the respective manufactures, and see pp. 198, 191–2, 203.

321. Contrast the Pennine Chain and the Lake Region. See pp. 198–9.

322. Locate some of the chief pasture-lands for cattle in England. See p. 199 (second paragraph).

323. Give a general account of the southeast of England, and state how it contrasts with the north and west. See p. 199, and comp. pp. 196, 198.

324. Why are there few large manufacturing towns in the southeast of England? Comp. p. 199 with p. 186 (2).

325. What is the general characteristic of the rivers of the Wash basin? See p. 199.

326. What indications are there apart from history of the fact that Kelts inhabited at an early period a much larger part of Great Britain than they do now? See p. 195.

327. In what districts did the ancient Britons retain their independence longest, and how do the physical features of the country help to explain the fact in each case? See p. 195.

328. Where else in Europe than in Wales is a Keltic dialect still spoken? See pp. 208 (foot), 188 (middle), 205 (top).

329. Describe the fen lands of England, and state how they have acquired their present aspect. See p. 199 and cut, p. 200.

330. Why does draining occupy so important a place in British agriculture? In what other parts of Europe would you expect it to have like importance? See p. 199, and comp. pp. 185 (near the bottom) and 249 (top).

331. How do you account for the termination of the name Anglesey? Mention any other European names that have the same or an equivalent termination. See p. 196, and comp. p. 261 (*n.* 1), 259.

332. What is the chief explanation of the high density of the population in the corn counties south of the Thames? See pp. 199, 190.

333. What are the principal circumstances which account for the importance of Birmingham? See p. 203 and comp. pp. 61 (5) and 61 (3) (*a*).

334. Mention a town in England which owes its importance to medicinal waters? See p. 203.

335. Mention any part of England which has to be protected by dykes against the sea? See p. 199.

336. What are the circumstances that account for the precise position of Sheffield and the nature of the industry carried on there? See p. 203 and p. 61 (2) (*d*) and (5).

337. How does the distribution of the iron industry in England compare with that of America? See pp. 186 (2), 203, 128.

338. Show how mineral wealth has determined the situation of important towns in England? See pp. 201, 202, 203; comp. p. 94, 191.

See also Questions 49, 50, 98, 109, 164, 172, 183, 187, 204, 205, 207, 209, 235, 236, 358, 379, 404, 408, 417, 420, 466, 524.

SCOTLAND.

339. Give a general account of the distribution of highlands and lowlands in Scotland? See p. 198.

340. To what strait in South Britain may Glen More or the Great Glen of Scotland be compared, and in what respects do they agree and differ? See p. 198, and comp. p. 196.

341. How can you explain the nature of the physical features of Scotland between Glen More and the Central Lowlands? See p. 198 and comp. Introd. p. 32 (General Result of the Action of Water).

342. How do you explain the existence of Glen More itself? See p. 198, and comp. pp. 26, 32, 54, and 55 (*n.* 2).

343. Contrast this portion of the Highlands of Scotland with the mountains of Wales, and compare them with the Cheviot Hills as regards communication? See p. 198, and comp. pp. 195–6.

344. Why should the climate of the Scottish Highlands be in general so cold and damp? See p. 190, and comp. p. 52 (3) (*a*).

345. State what you know of the resources and industries of the islands belonging to Scotland? See p. 196 (second paragraph in fine print).

346. In what other parts of the world are formations like the Scottish firths to be seen? See pp. 96 (middle), 69 (middle).

347. How does such a coast line indirectly assist the manufacturing industries of Scotch cities? See p. 186 (3).

348. What circumstances have rendered the chief coal-fields of Scotland of special value for the development of manufacturing industries? See p. 203–4, and comp. p. 186 (2).

349. Name the more important of the manufacturing towns within the area of the coal-fields, and also of those outside their area? See p. 203–4.

350. Explain the importance of Edinburgh. In what respect is it like the city of Athens? See p. 203; compare p. 284 (top).

351. Give an account of the growth of Glasgow, and its principal industries, and show how its growth was influenced by its situation. See p. 203, and comp. p. 61 (5) and p. 202 (Bristol).

352. Mention any towns you know of in England or Scotland besides Glasgow which owe their present importance in a large measure to changes made by man. See p. 202 (Liverpool), (and foot).

See also Questions 312, 331, 375, 381, 488, 502, 528, 554, 780, 781.

IRELAND.

353. Can you give any reason for the decay of manufacturing in Dublin? See pp. 205, 192.

354. Name the bays or inlets on the east coast of Ireland that are least suited for shipping, those which are best suited, and those which have seaports at their mouths. Of the last referred to, state which have seaports at the head as well as at the mouth. See p. 205, and comp. Map.

355. Mention the chief port of call for American steamers in the north and south of Ireland respectively. See p. 205.

356. In what respect does the surface of Ireland agree with that of Britain, and in what does it differ from the latter. See p. 204, and comp. pp. 198–9.

357. How do you account for the prevalence of bog in Ireland, and more particularly on one side of the island. See p. 204, and comp. p. 190 (Climate). See also Question 481.

358. Explain the poverty of Ireland in coal, and state why the Irish coal-fields are of less importance (apart from their small extent) than those of England, Scotland, and Wales. See p. 192, and comp. pp. 203 (under Sheffield) and 186 (2).

359. With regard to the nature of her agricultural products, with what parts of Great Britain does Ireland correspond, and why so? See p. 204, and comp. p. 190.

See also Questions 297, 399, 481.

FRANCE.

360. Mention some of the chief circumstances which have tended to promote the unity of the French people. See p. 136 (top and near bottom), and p. 206 (top).

361. Show how the physical configuration of France is marked out by some of its most important canals. See pp. 206, 213 and Map.

362. Can you mention any circumstances that would help to explain the fertility of the Limagne? See p. 206, and consider in your answer what is stated on p. 37 (5), p. 329 (near the bottom), p. 25 (1), and p. 52 (3) (*a*).

363. Why is France so rich in navigable rivers? See p. 207, and comp. p. 51 (2), p. 52 (3), p. 185, and consider the physical configuration of France, pp. 205–6.

364. Why is the Rhone of less use for navigation than the other great rivers of France. Explain the contrast. See p. 207.

365. Explain the contrast between the climate of eastern and that of western France. In what part of France would you expect to find the severest climate? See pp. 207–8, 41 (first half of page), p. 51 (last complete paragraph), and p. 52 (3) (*b*).

366. Explain why wine is grown in the northeast of France and not in the northwest. See p. 208, and comp. p. 186 (middle).

367. Describe the situation of the chief manufacturing regions of France, and explain why they are so situated. See p. 208, and comp. p. 61 (5); see also p. 210 (near the top).

368. What are the principal manufacturing industries of Lille, and what are the chief circumstances which favor their being carried on? See p. 208, and comp. p. 186 (bottom), 191 (near the bottom), 216 (near the bottom).

369. Why should you expect to find silk rather than cotton or woollen manufactures flourishing at Lyons? See p. 208, and comp. pp. 210 (near the top) and 212 (near the top).

370. What French place names do we find repeated in America? See pp. 211 (top), 158, 213 (top), 146. See Maps.

371. What favors the carrying on of cotton manufactures at Rouen? See p. 210, and comp. Question 320.

372. Mention the principal circumstances that contributed to determine the precise situation of Paris and its subsequent importance. See p. 210, and comp. pp. 61 (2) (*a*), (3) and (4), and p. 206.

373. Mention the chief circumstances that give importance to the situation of Lyons. See pp. 207, 208, 61 (2) (*a*) and (*b*), and 235 (comparing end of first complete paragraph on p. 60).

374. Why was it of importance to France to construct a naval station at Cherbourg, notwithstanding the unfavorable character of the situation? See p. 210, and consult Map.

375. What reasons were there for deepening the river Clyde as far as Glasgow which did not exist for deepening the Loire when silted up as far as Nantes? See p. 211 (top), and comp. p. 203.

376. Explain fully the advantages of the situation of Orléans. See p. 211, but consider in your answer not only what is there stated, but also what is stated on p. 60 (last paragraph), and p. 61 under (2) (*b*).

377. Compare St. Nazaire and Pauillac with respect to their origin. See p. 211.

378. Explain the small density of population in the district south of the Gironde. See p. 211.

379. What is the chief manufacturing industry of Reims, and why should it be so? Can you mention any corresponding examples in the British Isles? See p. 212, and comp. pp. 198 (foot), 203 (near top).

380. Why should the Central Plateau of France be bleak, unproductive, and thinly peopled? Mention three considerable towns belonging to this region and explain their importance? See p. 52 (3) (*b*), 212 (and references).

381. Why should the province of Champagne have been the scene of numerous battles? See p. 212 (*n.* 1).

382. Can you indicate any reasons why the western slopes of the hills of Champagne should be preferred for the cultivation of the vine in that part of France? See p. 212, and consider, first, the general slope of the surface in this region, and, secondly, the effect of the altitude of the sun (p. 22). Consult Map.

383. Can you give any reason why the Burgundian Plain and the eastern slopes of the Côte d'Or should have a specially warm and dry climate? See pp. 212 and 207 (top), and consider the distribution of the mountains and highlands of the northeast of France, especially of the Faucilles and Vosges, and the effect of mountain barriers; p. 52 (3) (*a*) and p. 184 (middle). See also the account of the vine-limit on p. 186.

384. Explain the importance of Dijon and Châlon-sur-Saône. See p. 212, and comp. pp. 60 (last paragraph) and 61 (3).

385. To what circumstance does the province of Provence owe its name? See p. 213 (top, and *n.* 1).

386. Mention any French seaports which have sunk in importance through coast deposits or the silting up of river mouths. See pp. 210–11, 213.

387. Explain the situation and rapid growth of Marseilles, and note particularly an important physical feature on the eastern frontier of France which helps to account for its commercial importance. See p. 213, and comp. p. 207.

388. What is the chief scourge of the climate of Marseilles, to what is it due, and why are the neighboring health resorts of Cannes, Nice, and Mentone less visited by this scourge? See p. 213, and comp. p. 52 (3) (*a*) and p. 184 (middle). Consult Map.

389. How many towns are there in France with a population exceeding that of Bristol? See pp. 202 and 208–13.

390. Mention any parts of France in which the inhabitants do not

speak French, and state what language is spoken in each. See pp. 208–9, 211 (3), and 213.

391. Name the chief naval stations of France, and state the advantages and disadvantages of the site of each. See pp. 210, 211, and 213.

See also Questions 75, 166, 170, 171, 188, 204, 209, 230, 231, 236, 330, 410, 415, 420, 422, 441, 457, 461, 466, 477, 517, 519, 532, 535, 539, 544, 548, 617, 620, 678.

BELGIUM AND HOLLAND.

392. Explain the names Holland and Netherlands, and state how they are properly applied. What circumstance made it natural that the name Holland should come to be used for the whole kingdom of the Netherlands? See p. 214 (text), and 213 (*n.* 5).

393. What is the physical history of the lowlands of Belgium and Holland? See p. 214–15.

394. Why should it be necessary to drain the Dutch polders by machinery? See p. 215, and consider in your answer what is said on p. 185 as to the rainfall of Europe, and on pp. 49 and 182 (last paragraph) as to evaporation.

395. Why is it now proposed to dig a new channel for the lower Maas? See p. 215 (small type), and, to make your answer complete, consult the pages of the Introduction there referred to.

396. How does the physical structure of the lowlands of Holland and Belgium facilitate the construction of canals? What part of England has a similar advantage? See p. 116 (top), and comp. p. 199.

397. In what way do the canals of the Hohe Veenen differ from those of Holland proper? See p. 216.

398. Why is the production of wine confined to the southeast of Belgium? See p. 216, and comp. p. 186. Does the character of the surface there present any advantage for the cultivation of the vine? Comp. Question 382.

399. What favors the carrying on of linen manufactures in Holland and Belgium? Can you mention any part of the British Isles in which this industry is similarly favored? See pp. 217, 216 (bottom), and comp. pp. 204–5.

400. What are the chief causes which combine to make Holland noted for the building of wooden ships? See p. 217 and p. 216 (middle of first paragraph of large print.

401. In what way does the history of Holland and Belgium help to account for the high density of population in these countries? See pp. 217–18 and comp. p. 216 (middle).

402. In what respect were the seaports of the Netherlands more favorably situated for commerce than London in the Middle Ages? See p. 217 and p. 218 (top), and comp. p. 193.

403. Compare Antwerp with London as to situation (in latitude and in other respects) and advantages for foreign commerce. See pp. 217–18, and comp. p. 199. See Map.

404. What district of Belgium corresponds most closely to the Black Country of England? See p. 219, and comp. p. 203.

405. What other part in Holland has outstripped Amsterdam, and why? By what means has the disadvantage under which the port of Amsterdam labored been remedied? See p. 219.

See also Questions 51, 75, 104, 134, 183, 220, 232, 236, 330, 417, 419, 435, 488, 498, 579.

GERMANY.

406. To what does the valley of the Rhine between Basel and Mainz owe its advantages of soil and climate? See p. 221, and comp. p. 37 (5) and p. 52 (3) (*a*).

407. State in general terms where the mineral wealth of Germany is most abundant. See p. 222.

408. What advantages and disadvantages respectively belong to the manufacturing region in the west of Germany, as compared with the manufacturing districts of Lancashire and the southwest of Yorkshire? See p. 222 and comp. pp. 203, 191, and 186 (2).

409. To what English towns do Chemnitz and Aachen respectively correspond, so far as regards the nature of their chief manufacturing industries? See p. 222, and comp pp. 202–3.

410. Compare the chief agricultural products of Germany with those of Great Britain and France, noting particularly those which are important in Germany but little grown in one or both of the other two countries, and those which are important in one or both of the other two countries but less so in Germany. See p. 223, and comp. pp. 190 and 208.

411. How do we know that Central Europe must have been much less populous in ancient times than it is now? See p. 223 (second paragraph).

412. Why should the Rhine be subject to inundations between Basel and Mainz? What consequence of that fact can you point out? See p. 223, and comp. p. 27.

413. How do the physical features of Germany explain why that country was early broken up into a large number of small states, and

why the largest state was ultimately formed in the north? See p. 223, and comp. pp. 220–21.

414. Explain the situation of the German seaports on the German Ocean. See pp. 225–6, and comp. p. 44.

415. Can you mention any French towns the origin of which was similar to that of Bremerhaven? See p. 225, and comp. p. 211.

416. Why should Cuxhaven be of less importance to Hamburg than Bremerhaven to Bremen, and why is its importance greatest in winter? See p. 225–6, and comp. p. 57 (top).

417. Compare Hamburg, Antwerp, and London as regards their advantages for foreign and inland commerce, noting particularly any advantage which one of the three possesses over one or both of the others. Consider in your answer the fact implied in the last question, and the advantage of having a seaport open all the year round; consider also the facilities for water and other communications with the interior, and especially with manufacturing regions and other large markets, the distance of the chief foreign seaports, and the importance of a central situation in the land. See pp. 199–201, 192 (last paragraph of large type), 218 (bottom), and 61 (3) (*a*), 225 and 227 (large print).

418. What French naval station had to be artificially constructed like that of Wilhelmshaven? What advantage was secured by the construction of the latter? See pp. 226 and 210, and comp. p. 186 (top), p. 182 (near bottom), and p. 57 (top).

419. What inlet in Holland arose in the same way as the Jahde? See p. 226, and comp. pp. 214–15.

420. With what coasts in the British Isles and in France does the eastern coast of Schleswig-Holstein correspond? In what respects do they agree, and in what respects do they differ? See p. 226 (large type), and comp. pp. 190, 204, 210.

421. Explain the decline of Lubeck as a centre of commerce. See p. 226.

422. What part of the French coast does that of Eastern Pomerania resemble, and in what respects? See p. 226, and comp. p. 211 (3).

423. Describe the Prussian Haffs. What Dutch inlet corresponds to them? Mention the points of agreement and difference between them and the Dutch inlet referred to. Name the chief seaports on the Haffs, and explain the position of each. See pp. 226–7, and comp. pp. 214–15.

424. Contrast the situation of London, Paris, and Berlin, pointing out the advantages of each and any disadvantages belonging to the site of any one of them. See pp. 199–201, 210, 227, and comp. pp. 60–61.

425. What is the Saxon Switzerland? Is there anything appropriate or anything inappropriate in the name? See p. 228 (top).

426. What town on the Loire would you compare to Magdeburg

with respect to the nature of the site, and why? See p. 227, and comp. p. 211.

427. In what respect does the situation of Ratisbon correspond with that of Magdeburg? See pp. 227 and 228, consult Map, and see p. 61 (2) (*b*).

428. Mention the circumstances that explain the precise situation and the present or past commercial importance of Leipzig, Augsburg, and Ulm. See p. 228, and comp. p. 61.

429. From the nature of the commercial advantages which at one time gave peculiar importance to Ulm and Augsburg, what events would you consider most likely to have led to their decline? See p. 228, and comp. pp. 193 (near the bottom) and 273 (under Venice).

430. Mention six German towns that owe their importance in great part to the mineral wealth in their neighborhood, and state the nature of the mineral wealth in each case. See pp. 222, 223, 227.

431. Mention three German towns of importance in connection with the sugar refining industry, and state what specially adapts the towns referred to for this occupation. See pp. 227–8.

432. Mention any other towns in Germany noted for a particular industry the raw material for which is obtained in the neighborhood. See pp. 227, 228–9.

433. Why is Strassburg situated at some distance from the Rhine? See p. 228, and comp. p. 223.

434. How would you account for the position of towns occupying situations like those occupied by Eisenach, Gotha, Erfurt, and Weimar? See p. 229, and comp. p. 61 (3), and especially (3) (*b*).

435. Can you mention any important Belgian town that has a similar situation? See p. 219.

See also Questions 52, 72, 75, 104, 164, 170, 204, 209, 237, 330, 445, 466, 475, 479, 493, 496, 517, 541, 557, 603, 667, 774.

THE ALPS.

436. On what grounds are the Alps to be regarded as the most important mountain system in Europe? See p. 229.

437. What is indicated by the arrangement of the strata in the Alps. See p. 229, and comp. p. 34 (Mountain-building).

438. What are the Limestone Alps, and where are they situated? See p. 231.

439. Distinguish longitudinal and transverse valleys, and give examples of each from the Alps. To what part of the system do the longitudinal valleys belong, and what is to be noted in general with

regard to their direction? See pp. 231, 233, and 245, and consult Map.

440. In what respects is the valley of the Upper Rhone the most important of the longitudinal valleys of the Alps? Are there any other longitudinal valleys of this system which are more important in any other respect? See pp. 231 and 233, and consult Map.

441. State roughly the ratio of the height of the highest peaks of the Alps to the height of the highest peaks in the different parts of the British Isles, and the highest peaks of the United States. To what country does the highest of all Alpine peaks belong? See pp. 231–3, and comp. pp. 198, 105.

442. What peculiarity in the structure of the Alps causes them to be less of a barrier to communication between the people on opposite sides than otherwise they would have been? What circumstance renders this a fact of peculiar importance? See p. 233, and comp. p. 229.

443. What gives importance to the fortress of Grenoble? See p. 233.

444. Why are the Mont Cenis, St. Gothard, and Brenner Passes, once so much frequented, now of less use? See pp. 233 and 234.

445. What are the towns that must have concentrated on each side of the Alps the trade carried on by each of these passes? See pp. 233 and 234, consult Map, and compare pp. 228 (near the bottom), 238 (about the middle), and 272–3.

446. What determines the principal occupation of the inhabitants of the Alps? What product would you expect to be the principal article of export trade among people so occupied? See p. 234, and comp. p. 237.

447. Why should the snow-line be higher on the southern side of the Alps than on the northern side? Does a similar rule necessarily hold good in all cases? If not, why? See p. 234, and comp. p. 52 (3) (*a*) and p. 53.

448. Why should the limit of forests on the Alps be also the limit of permanent habitation? See p. 234.

See also Questions 450, 455, 460, 462, 469, 518, 648.

SWITZERLAND.

449. Compare roughly the density of the population of the Swiss plateau with that of the more populous sections of Great Britain. See table on p. 370, note particularly the first paragraph of the chapter on Switzerland (pp. 234–5), and comp. p. 193.

450. Compare the Alps and the Jura. See p. 235 and pp. 229–34.

451. Why should the longitudinal valleys of the Jura have a bleak climate? See p. 235, and comp. p. 52 (*b*).

452. Why are the rivers of Switzerland of little use for navigation, and to what commercial purpose are they chiefly applied? See p. 235, and comp. p. 27.

453. What means has been adopted to protect the lower part of the Swiss plateau from inundations, and how does the method referred to effect the end desired? See p. 237 (top), and comp. p. 31.

454. What advantage does Switzerland possess for the carrying on of manufacturing industries, and under what disadvantages does it labor? See pp. 237 and 238 (first paragraph of small type).

455. Mention the principal circumstances that give commercial importance to Zürich. See not only p. 238, but also p. 235 (top), and p. 221 (end of section 2). See also Map.

456. What are the river-valleys by means of which Zürich communicates with the south? See p. 238, and comp. p. 60 (middle) and pp. 233–4.

457. What manufacturing town in France answers most closely to Basel in the nature of its situation and its principal manufactures? Indicate all the points of correspondence between the two and any advantages possessed by the one and not by the other. What circumstance indicates very strikingly the natural advantages belonging to the site of both? See p. 238, and comp. p. 208, p. 207 (near the bottom), and p. 61 (2) (*b*). See also Question 373 and consult Map.

458. In what respect does the situation of Geneva correspond with that of Zürich, and in what important respect do their situations differ? See p. 238, consult Map, and consider the form of the surface in the neighborhood of the two towns.

459. In what respect do Geneva and Basel correspond in situation? See p. 238, consult Map, and consider p. 60 (end of first complete paragraph).

See also Questions 51, 118, 445, 506, 527.

AUSTRIA-HUNGARY.

460. What are the principal passes across the Austrian Alps, and what gives importance to each of them? See pp. 239, 234 (top), and comp. p. 228 (under Augsburg), p. 273 (under Venice), and p. 244 (1) (3).

461. Compare the Moravian Gate with the depression occupied by

the Rhone and Rhine Canal, and state what seaports in the north and south of Europe are brought into direct communication by means of them. See p. 239, and consult Maps of Germany, France, and Austria.

462. Compare the Alps and the Carpathians with respect to their form and drainage. See pp. 240–41, 229, and 235 (last paragraph).

463. How do you explain the existence of the morasses on the borders of the Theiss and its tributaries? See p. 240, and comp. pp. 28 and 247 (under Szegedin).

464. Describe the Hungarian pusstas and state why fires should there be so necessary at night even in summer. See p. 240 and comp. p. 52 (bottom of the page).

465. Where is the population densest in Austria-Hungary, and what accounts for the superior density in the parts referred to? See p. 243, and comp. p. 241 (near the middle) and p. 244.

466. Compare Vienna as regards its situation with London, Paris, and Berlin, and note particularly all the circumstances that tend to give commercial importance to Vienna. See p. 244, and comp. pp. 199–201, 210, 227, and study p. 61.

467. Mention the chief manufacturing industries of Bohemia, and state what circumstances favor their pursuit. See pp. 244–5, comp. pp. 243 (near the top), 187 (first paragraph of small type), and p. 370, and consult Map. See also Question 585.

468. What are the advantages of the site of Prague? See p. 245 and comp. not only p. 61 (2) (3) and (4), but also pp. 240 (near the top), 225 (under Hamburg), and 60 (end of first complete paragraph).

469. Give a general account of the Alpine provinces of Austria. See pp. 245–6.

470. Why should the valley of the Etsch have more of an Italian than a Central European aspect? See p. 245 and comp. pp. 52 (3) (*a*), 184 (middle), and 269 (middle).

471. What is the meaning of the name Innsbruck? Describe the situation of the town so called. See p. 246, and comp. p. 234 (*n.* 1).

472. Give the names of the chief towns in Germany and Italy which carried on a large trade in the Middle Ages by way of Innsbruck. See pp. 228 (near the bottom) and 275 (near the top).

473. Describe the district known as the Karst, and explain its characteristics. See p. 246 and comp. p. 29.

474. What natural advantages has Trieste over Fiume? See p. 246, and comp. p. 239.

475. Explain the situation of Buda-Pest. In what respect does its situation resemble that of the capital of Belgium, and in what respect that of the capitals of Prussia and Bohemia? See p. 247, and comp. pp. 219, 227, 245.

476. Explain the situation of Szegedin, state what disadvantage there

is in the situation, and explain how this disadvantage was intensified in the manner stated in the text. See p. 247, and comp. p 61 (2) and p. 31 (bottom).

477. Compare the situation of Klausenburg and Clermont. See p. 247, and comp. p. 206.

478. Why are there few towns in the Austrian dominions on the Danube below Buda-Pest? See p. 247.

479. Compare Germany and Austria-Hungary as regards their advantages for foreign commerce and manufacturing industry. See pp. 239, 241, 223, 224 (under Rivers), 225 (comparing p. 226, under Lübeck); consider the distribution of European population generally and the facilities for trans-oceanic commerce,

See also Questions 183, 445, 482, 517, 543, 645, 678, 823, 835.

RUSSIA AND ROUMANIA.

480. Describe the Ural Mountains? Why is it natural that they should not form the boundary of European Russia? See p. 248.

481. Compare Russia with Ireland as regards size, surface, communications, and climate. What product important in Russia is important also in Ireland? Why are certain products important in Russia which are unknown or of little importance in Ireland? See pp. 248, 249, 251, and 187 (top), and comp. pp. 204, 192.

482. What part of the Austrian dominions suffers from a similar disadvantage as regards inland communications to that under which a large part of Russia suffers? See p. 249 (last paragraph), and comp. p. 247.

483. Why do we find in the southeast of Russia a depressed area occupied by one large inland sea and hundreds of small salt lakes instead of a single sea covering the whole area? See pp. 249 and 186 (end of small type), and comp. p. 31.

484. Explain the distribution of population in Russia. See p. 251.

485. In what parts of Russia do we meet with a population without fixed settlements? Describe the differences between the two regions, and the occupations of their inhabitants. See pp. 251–2.

486. From the account given on pp. 251–2, in what part of Russia would you expect that there was most room for an increase of population? State why.

487. Mention the chief circumstances that promote the unity of Russia and the chief obstacles to that unity. See p. 253.

488. Mention any other great seaports in Europe besides St. Petersburg that have been made accessible for the largest vessels by artificial

means, and state what the means in each case were. See p. 254 and comp. pp. 203 (near bottom) and p. 219 (middle).

489. Name two important Russian seaports which stand near the mouths of rivers, but not on the rivers themselves. What would you infer as to the character of the neighboring river mouth? What French seaport resembles them in situation? See p. 254, and comp. p. 213 (near the middle).

490. What part of Russia has the most equable climate, and why? See p. 254, and comp. p. 52 (3) *a*.

491. Why should wooden houses be so common in the interior of Russia? How is the building material likely to be conveyed to the southern plains? See p. 255, and comp. pp. 251, 249, and 217 (second complete paragraph).

492. What are the circumstances which have determined the precise position of Moscow, and which explain its importance? What large town in Central Europe corresponds to it in situation? What contributes to its importance as a seat of manufactures? See p. 255, and comp. pp. 227, 61 (2) (*d*). and (3) (*a*) and p. 62 (top).

493. What circumstances make the site of Nizhni-Novgorod a favorable one for the great fairs which are annually held there? What town in Central Europe is still noted for its fairs, and what differences in situation between the two may be noted? See p. 255 and comp. pp. 248, 61 (2) (*a*), 249, and 228 (near the top).

494. Mention two important towns in Western Europe and one on the Lower Danube that correspond in situation to Kazan. See p. 255, and comp. p. 238 and p. 256 (small type). See also Question 373, and consult Map.

495. What town in Russia has a similar industry to Birmingham? See p. 255, and comp. p. 203 (top).

496. What fact gives special importance to the site of Warsaw? Can you name any town on the Elbe which is important for a similar reason, and which has its importance in this respect still shown in the same way as Warsaw? See p. 255, and comp. p. 227 (middle).

497. What three populous towns indicate the importance of the Black Earth Region of Russia? In what part of that region do they lie, and why should they be found in that part of the region rather than elsewhere? See p. 255, and comp. pp. 251 (top) and 252 (top).

498. Compare the situation of Taganrog and Amsterdam as regards transmarine commerce. See p. 254, and comp. p. 219.

499. Give a general account of Roumania, and state why its chief agricultural product is so well suited to this part of Europe. See p. 255, and comp. p. 251 (top) and p. 187 (end of first paragraph).

See also Questions 114, 120, 122, 160, 161, 167, 204, 233, 330, 558, 576, 579, 602, 606, 607, 645, 814, 823, 824, 834, 835.

SCANDINAVIA.

500. What are the favorable climatic influences to which the western shores of Scandinavia are exposed? How are they shown in the cultivation and vegetation? Why do these influences make themselves felt only a short distance inland? See p. 256, and comp. pp. 185–6 and p. 52 (3) (*a*).

501. What is there in the form of the surface of the Scandinavian plateau to counteract the benefit of latitude in the south, so as to render its surface everywhere unfit for cultivation? See p. 256 (text and *n.* 3), and comp. p. 52 (*b*).

502. What parts of the coast of the British Isles present most resemblance to the west coast of Norway? What differences are there between the Scottish firths and the Norwegian fiords? See p. 257, and comp. p. 196, and consult Map.

503. What advantage would you expect Sweden to derive from the fact that the rivers generally expand at intervals into long lakes? See p. 257, and comp. p. 31 (bottom).

504. Why should oats be the principal grain crop of Sweden? With what parts of the British Islands does Sweden correspond in this respect, and how do these parts of the British Isles compare as regards latitude? See pp. 257 and 258 (second paragraph), comp. p. 190, and consult Atlas.

505. Explain the differences in the principal occupations of the people in Norway and Sweden. See pp. 257 and 258.

506. Can you mention any other country in Europe in which the chief use of the rivers is to float timber? See p. 257, and comp. p. 235 (bottom).

507. Why is it natural to find that Norway has a very large amount of shipping relatively to its population? Mention all the advantages that it has for carrying on this occupation, noting particularly those which it has over Sweden, and state what kind of ships (iron or wood, sailing or steam) are likely to form the largest proportion of those belonging to the country. See p. 257, and comp. pp. 185–6, and p. 48 (end of second complete paragraph).

508. Explain the advantages and disadvantages of the site of Stockholm. See pp. 258–9, and comp. p. 185. See also Question 511.

509. What advantage has Göteborg over other towns in Sweden for the carrying on of manufacturing industries? See p. 259, and consider the nature of the requirements for pursuing such industries. See also Question 371.

510. Why should matches be so largely made in Sweden? See p. 259, and comp. p. 257 (near the bottom).

511. Explain the situation of the present capital of Norway. Has its site any disadvantage as compared with the towns on the west coast? Is there any reason why the harbor of Göteborg should be less liable to freeze than that of Christiania? See p. 259, comp. p. 186 (top), and consult Map.

512. Mention all the circumstances that have favored the growth of Throndhjem. See p. 259, and comp. p. 61 (3) (*b*).

See also Questions 62, 173, 178, 209, 330, 331, 517, 569, 781, 813.

DENMARK.

513. Mention all the reasons that cause merchant vessels to prefer the Sound in entering and leaving the Baltic Sea. Show how the advantage stated in the text to be afforded by that route for sailing vessels is not afforded by any other route that might be followed. See p. 260, and consult Map.

514. Mention any other parts of the coast-line of Western Europe that resemble the west coast of Denmark. See p. 260, and comp. p. 214.

515. Why is it natural that the capital of Denmark should have grown up on its actual site? Why should there be so great a difference in population between the capital and the towns next in size in Denmark? See p. 261, and consider the circumstances that lead to the growth of large towns in general. See especially p. 62 (near the top).

See also Questions 72, 563, 579, 741.

THE IBERIAN PENINSULA.

516. In what part of the Iberian Peninsula would you expect to find the greatest number of natural harbors? See p. 262 (top), and comp. p. 48 (end of second complete paragraph). Can you mention any other parts of Europe besides those mentioned in the text in which a similar coast is met with? See pp. 190, 204, 210 (middle), 213, 226 (large type), 257 (top), 260 (middle), 239, 246 (*n.* 4).

517. Give a general account of the surface of the Iberian Peninsula, and mention any other parts of Europe in which there is a large extent of table-land. See p. 262, and comp. pp. 206–7, 221, 235, 239–40, and 241 (top).

518. Compare the Pyrenees and the Alps as regards situation, height, and structure, noting any particulars in which they agree or differ. See p. 262, and comp. pp. 229-34.

519. Compare the chief rivers of France with those of the Iberian Peninsula as regards the direction in which they flow, the nature of their basins, and their navigability. See p. 263, and comp. p. 207.

520. What is likely to be the most important use of the rivers of Spain? See the account of the climate, pp. 263–4; see also p. 266 (2), and comp. p. 184 (near the bottom).

521. For what branch of manufacturing do the table-lands of Spain afford the means of supplying the raw materials? See pp. 264 (top), 198 (5), comp. Question 379.

522. From the account of the products of Spain on pp. 263–4, what would you expect to be the chief exports of that country?

523. Show how the physical features of Spain favored the growth of numerous independent states. See p. 264, comp. pp. 262–3, and consult Map. See also Question 413.

524. Can you mention any other two countries in Europe the boundary between which was determined by similar circumstances to those which explain the separation of Spain and Portugal? State all the points in which the two cases are parallel, considering particularly the distribution of population. See p. 265, and comp. p. 196.

525. Can you mention any other part of Europe besides Catalonia where a soil not naturally fertile has been rendered highly productive by the energy of the inhabitants? See p. 265 (bottom), and comp. p. 216.

526. How and where do the physical features of Spain facilitate the construction of irrigation work? Remember that water always flows downward. See pp. 266–7.

527. What towns in Germany, France, and Switzerland have a similar staple manufacturing industry to Valencia? See p. 266, and comp. pp. 208, 222, and 238.

528. What reason was there for deepening the Guadalquivir to Seville instead of founding a new seaport lower down on the Guadalquivir, as at Pauillac, St. Nazaire, and Bremerhaven? See p. 264 (end of first paragraph). Can you mention any other important river port which has been made accessible to large sea-going ships in the same way for another reason? See pp. 203 and 88 (foot).

529. Mention some naval stations in France and Britain occupying similar situations to Ferrol. See p. 267, and comp. pp. 210, 202.

530. Mention two towns in Spain that owe their importance chiefly to their central situation, and two in which facilities for defence determined the choice of site. See pp. 266 and 267.

531. Explain the importance of Zaragoza. Can you mention any

towns elsewhere occupying a similar situation? See p. 269, and comp. p. 61 (3).

See also Questions 30, 75, 98, 166, 168, 229, 236, 237, 534, 536, 558, 619, 672, 725.

ITALY.

532. Mention some of the most striking illustrations in Italy of the shelter afforded by mountains on the north. Point out some corresponding cases in France and Russia. See pp. 269, 273 (*n.* 2), 213, 254 (near bottom).

533. Can you mention any other reason why the vegetation round the lakes which lie along the southern base of the Alps should give evidences of a milder climate than that of the valley of the Po, besides the fact that the former is more immediately under the shelter of a mountain barrier? Consider in your answer the effect of large bodies of water on temperature, and the effect of the cooling of air on its density. See pp. 269, 50 (1), 43, and p. 38 (near the bottom.)

534. How would you account for the unhealthiness of many parts of the Italian coast? Can you mention any part of Spain that is similarly unhealthy, and explain why other parts of the coast of Spain are free from the scourge where the physical features are similar to those of the unhealthy parts of Italy? See p. 270, and comp. pp. 57, 264 (near the end of the first paragraph), 266 (2).

535. On what part of the coast of the Gulf of Mexico are lagoons used for a similar purpose to the Val di Comacchio? Has the Val di Comacchio any advantages over those in America for the purpose referred to? See p. 270, and comp. p. 131, p. 67 (near the bottom), and p. 49 (near the bottom). See Isothermal Map.

536. Why should pastures be more extensive in Italy than in Spain? Consider in your answer the effect of mountains as compared with tablelands on rainfall, and see p. 270, and comp. p. 52 (3) (*a*) and pp. 263–4 (Climate of the Iberian Peninsula).

537. Compare the situation of Italy in the Middle Ages with that of Great Britain at the present day. See p. 271, 192 (foot), 193 (top).

538. What circumstances are favorable and what unfavorable to the unity of the Italian people? How are these illustrated in the history of the country? See pp. 269–271, 275 (middle).

539. What part of France corresponds most in its products to the plains of Northern Italy? What product of these plains is not met with in France? See p. 272, and comp. p. 208.

540. Show from several examples how the situation of mountain

passes has affected the position and importance of towns in Italy. Can you mention any similar cases in Switzerland and Germany? See pp. 272, 273, 275, 228, 238.

541. In what respect do Milan and Leipzig correspond in situation? See p. 272, and comp. p. 228.

542. What California town corresponds most closely in situation and climate with Florence? Indicate the points of correspondence. Mention any circumstances that help to explain the difference in size between the two towns referred to. See pp. 273, 160, and Maps.

543. What town in Austria-Hungary corresponds in situation to Piacenza? See p. 272, and comp. p. 247.

544. What French fortress occupies a similar situation to Verona? See p. 272 (*n.* 3) and comp. p. 233 (1), (*b*).

545. Show how modern engineering works outside of Italy have affected the prosperity of certain Italian seaports. See p. 273.

546. In what two respects does the situation of Florence correspond with that of Milan, and in what important respect do the situations of the two towns differ? See pp. 273–5, and comp. p. 272; consult Map.

547. Contrast the distribution of temperature in winter north and south of the Apennines with that which is observed in Great Britain and explain the difference. See pp. 273 (*n.* 2), 190, 52 (3) (*a*), and 185–6.

548. What Asiatic and European seaports have declined from the same cause as Pisa? See p. 275, and comp. pp. 271, 273, 276, 210–211, 298.

549. Mention the more important circumstances that have contributed to determine the situation and early importance of Rome. See p. 275, with the references in *n.* 2.

550. Why should maize be grown on the northern plains of Italy, but not (to any great extent) in Sicily and southern Italy? Where maize is cultivated in the more southerly parts of the Italian kingdom, what mode of cultivation must necessarily be adopted? See pp. 272, 276, and comp. the account of the Mediterranean rainfall on p. 184 with p. 187 (near the top).

551. What notable indication of a dense population is there in Sicily? See p. 276, and comp. Denmark, p. 261 (small type).

See also Questions 30, 33, 63, 104, 117, 445, 565, 570, 571, 616, 623, 634, 648, 661, 814.

THE BALKAN PENINSULA.

552. How is the present outline of the Balkan Peninsula to be accounted for? What parts of the outline of Western Europe may be similarly explained? See p. 277, and comp. p. 182 (top), and see Map.

553. From the account given in the passages referred to in the previous question what would you expect to be the form of the coast-line in the case of land which had been free from changes of level for a very long period in a geological sense? In your answer consider the ultimate effect of the action of running water. See p. 32.

554. Can you mention any part of the British Isles in which the form of the surface is as unfavorable to the construction of roads as it is in the Balkan Peninsula, and give any reason why this is an even more serious drawback in the Balkan Peninsula than in the part of the British Isles alluded to? See p. 277, and comp. p. 198; and consider in your answer the distribution of population.

555. Describe the situation and general character and aspect of the Dinaric Alps. See p. 278, and the passage referred to in *n.* 1 on that page.

556. Can you give any reason derived from the physical features of Greece why Mount Parnassus should have occupied so prominent a place in Greek literature? See p. 278.

557. In what part of the chain do the Balkan Mountains not form a water-parting? Can you mention any other instance in which a similar breach occurs in a European mountain chain? See p. 279 (middle), and comp. p. 228 (top).

558. What is the Iron Gate? Can you mention any other part of Europe where an interruption to river navigation arises from the same cause as here? See p. 279, and comp. pp. 249 (2), 263.

559. Can you give any reason why the rainfall should be more abundant in the Balkan Peninsula than in Spain? See Question 536, and consider the source of the vapor which falls as rain, and the situation of the Balkan Peninsula. See p. 49 (near the bottom), and refer to Map.

560. Mention the principal circumstances which account for the remarkably low density of population in the Balkan Peninsula. Mention any other countries of Europe in which the history helps in a notable degree to explain the degree of density of the population. See p. 280, and comp. pp. 217–18.

561. Are the groups into which the inhabitants of the Balkan Peninsula are divided on p. 280 necessarily to be regarded as composed of different races? If not, why not? Give an illustration from the

Balkan Peninsula itself in support of your answer. See pp. 188 and 280 (2).

562. Mention any other parts of Europe in which the highly irregular character of the surface has proved for a longer or shorter period an obstacle to the maintenance of a single rule, distinguishing those parts in which the state of division is still more or less maintained. See pp. 281, 224 (comp. pp. 221 and 227—under Berlin), pp. 238, 243, 264 (bottom), 270–71. In each case consult Map.

563. Mention all the advantages of the site of Constantinople. Give the name of any other European seaport which is similarly situated at the crossing of sea and land routes, and indicate the advantages which Constantinople has over it. Remember in your answer the distribution of population, and with reference to Constantinople consider not only p. 281, but also p. 280 (near the middle). See p. 261 (near the top), (comparing first paragraph of p. 260 and the end of first complete paragraph on p. 259).

564. What work now in progress is likely to give additional importance to the seaport of Salonica? See pp. 277–8.

565. What are the advantages of the site of Adrianople? Indicate the points of correspondence between its situation and those of Lyons, Mainz (Mayence), Zaragoza, and Florence. See p. 282, and comp. pp. 207, 221 (2), 269 (top), and 273 (bottom). In each case consult Map.

566. Mention the principal towns in the two chief depressions that intersect the Balkan Peninsula. See pp. 277–8.

567. Explain why there are so many considerable towns on the Danube in Bulgaria and comparatively few in Roumania. See p. 283 (2).

568. Mention different parts of the Mediterranean peninsulas in which wheat is the principal crop, and explain why it should be so. See pp. 264, 276, 283 (6), and comp. Question 550, with the passages there referred to.

569. Compare Greece and Norway as regards advantages for shipping. Consider in your answer the supply of material for ship-building. See p. 283, and comp. pp. 257 and 246 (*n.* 4).

570. What seaport in the Mediterranean occupies a similar situation to Hermopolis, and hence has a similar trade? See p. 284, and comp. p. 277 (top).

571. Mention any Italian names of places in the Balkan Peninsula, and explain how they have come into use. See p. 278 (*n.* 2 and 3), p. 283 (below the middle).

See also Questions 48, 140, 586, 587, 661.

GENERAL QUESTIONS ON EUROPEAN COUNTRIES.

572. In what part of Europe does the point farthest from the sea lie? See Map.

573. What are the most extensive mountain systems in Europe, and where are the highest peaks? See pp. 183 and 229–33.

574. Name the chief mountain chains of Europe that have easy passes, and the chief of those which have difficult passes, relatively to their height. See pp. 233, 248, 262, 269, 275, 279.

575. Mention the principal districts of Europe in which the remains of extinct volcanoes are still conspicuous, and state how they are conspicuous. See pp. 206, 221, 270.

576. Mention and describe the areas of Europe below sea-level, pointing out the points of contrast as to climate, density of population, etc. See pp. 214, 249, 250 (foot), 251, 252.

577. Name the European rivers most important for inland navigation (pp. 207, 223, 241, 249, 263), and state where the rivers of most use for irrigation (pp. 184, 266–7, 271) and for floating timber (pp. 235, 257, 217) are to be found.

578. State what parts of Europe are noted for their naturally rich and fertile soil. In what part of Europe are the most extensive tracts of such soil to be found? What is to be noted regarding the character of the agriculture in this region? See pp. 215, 221 (2), 222, 240 (bottom), 251–2.

579. What country in Europe is the most important for its wheat export? What country grows the largest amount of wheat relatively to area, and what country grows the largest amount of grain of all kinds relatively to population? See pp. 252, 216 (*n.* 4), 260.

580. Compare the situation of Great Britain with that of other countries that took the lead in the commerce of the world before Great Britain. See pp. 192–3, 217–18, 271 (near the top), 273 (near the top), 226 (under Lübeck).

581. What sort of climate would you infer to be most suitable for the growth of sugar-beet from the places in which it is chiefly grown? See pp. 208, 227, and comp. pp. 185–6.

582. What countries in Europe are the most important for their wine production? See pp. 207, 270, 264, 241, 265, 223, and see p. 186. (The countries are here referred to in the order of their importance in respect of this product.)

583. What districts of Europe are chiefly noted for their production of raw silk? See pp. 208, 272.

584. What are the most important European countries for the export of timber? See pp. 251, 257.

585. (*a*) Describe the situation of those districts in Europe in which textile or other manufacturing industries are favored by the production of the raw material of the manufacture in the neighborhood, and state in each case the nature of the manufacture and the raw material; (*b*) state what districts have manufacturing industries promoted by abundance of coal and iron; and (*c*) name any district you know of with flourishing manufactures, but without coal and iron and without local supplies of raw material. (*a*) See pp. 201, 203, 205, 209, 212 (near the top), 227 (under Breslau, Magdeburg, and Halle), 244-5, 255, 266, 272; (*b*) 201-3, 209, 217, 222, 241, 255; (*c*) 237.

586. Mention the states of Europe most remarkable for the diversity of languages spoken within their boundaries. See pp. 238, 241, 253, 280.

587. (*a*) Mention all the capitals of Europe which have owed their position as capital chiefly to their central situation; and (*b*), in the case of those capitals which are not centrally situated, explain what circumstances give special importance to their site and render them more suitable for capitals than towns more centrally situated. (*a*) See pp. 219, 227, 238, 256, 267; (*b*) see pp. 199, 203, 210, 219, 244, 254, 259, 261, 265, 275, 281.

588. Mention all the parts of Europe in which a language descended from the Latin is spoken. See pp. 209, 218, 238, 245 (2), 256, 271.

589. Mention some of the more important towns in Europe situated at points where a river makes an abrupt change in its direction (see Atlas, Question 373, and pp. 238, 255, 256); where a river can be most easily or most conveniently bridged (see pp. 211, 227, 247, 272); at the confluence of the two rivers (see p. 208 (comparing Question 373), pp. 210, 219, 245, 247, 255, 282); at the point of convergence of mountain or hill passes (see pp. 219, 228 (three towns), 229, 272 (two towns), 275, 282); in the centre of rich plains without any important rivers in their immediate neighborhood (see pp. 228, 256, 272).

See also Questions 5, 6, 11, 12, 16, 38, 42, 46, 165, 614, 663, 664, 695, 704, 809, 814.

ASIA.

590. Can you give any general reason derived from climate to explain the contrast in the distribution of population in Europe and Asia relatively to the parallel of 40° N.? See p. 286, and comp. p. 51 (near the bottom) and p. 289.

591. Mention all the chief points of correspondence and difference between the peninsulas in the south of Asia and those in the south of Europe. See pp. 286, 287, 302, 306, 316.

592. State the chief points of correspondence and difference between the Sea of Okhotsk and the southern extension of the Arctic Ocean. See pp. 286 and 24, and consult Map.

593. Indicate the same points regarding the Sea of Japan and the North Sea. See pp. 287 and 182, and consult Map.

594. Compare Europe and Asia as regards the arrangement of the principal mountain systems and table-lands. See pp. 287, 183, 205–6, 221, 235, 256, 262.

595. Can you point to any minor instances in Europe of the intersection of mountain chains or ranges of hills by rivers, as happens so frequently in Asia? See p. 288 (3), and pp. 228 (near the top), and 279.

596. How does the great elevation of the region in which the principal rivers of Asia have their head-waters explain the fact of their being copiously supplied with water? See p. 288, and comp. p. 52 (3) (*a*).

597. Compare Europe and Asia as regards their salt lakes. See pp. 288–9, 295, 299, and 250.

598. Explain why Asia exhibits greater extremes of climate than Europe, and why there should be a mitigation of these extremes on the eastern seaboard. See p. 289, and comp. pp. 51 (2), and 43.

599. What are the principal areas of summer rainfall in Asia and Europe? How do these areas differ as regards the rainfall in the two continents? See p. 289 (comparing pp. 42 and 51 (*b*)), and pp. 185 and 186.

600. Contrast the general distribution of population in Europe and Asia, and explain the differences. See pp. 289 (second paragraph of small type), 187, 196, 217–18, 222, 271–2.

601. What section of the inhabitants of Asia is allied in language to the majority of the inhabitants of Europe? Mention the chief divisions of the people of Europe that are so allied. See p. 290 (near the top), and comp. p. 188.

ASIATIC COUNTRIES.

I. *Countries outside of the Monsoon Region.*

602. Compare Siberia and European Russia as regards extent, surface, and the number and distribution of the population. See pp. 291–3, 248, 251, and table p. 370.

603. In what respect do Siberia and Germany correspond with one

another with regard to the situation in which the principal minerals are found? See pp. 291–2, 222.

604. How does the Siberian vegetation illustrate the extremes of the climate? Can you give any illustrations of the same kind in Europe? See p. 292, and comp. pp. 186 and 208 (top).

605. What is likely to constitute a peculiar difficulty in laying roads and railways in Siberia? See p. 292 (near the top), and comp. p. 60.

606. From what drawback do the great rivers of Siberia suffer as channels of communication in a greater degree than the Russian rivers of the White Sea basin? See p. 292 (*n.* 4), and comp. p. 249 (3).

607. Describe the trade route between China and Russia through Siberia. What pass across the Ural Mountains is chiefly used on this route? To what great commercial centre in Russia does it lead? What are the circumstances that determine the precise position of Tobolsk?, See p. 292, and comp. pp. 248, 255.

608. What circumstances have determined the precise position of Yakutsk? Can you mention any large European town that corresponds to this one in position? See p. 293 and comp. p. 244.

609. What is to be noted in general regarding the position of the principal towns of that portion of Central Asia which is under Russian rule or Russian influence? Can you mention any large towns in Europe the importance of which is to be explained in the same way? See p. 293, and comp. pp. 266 and 267 (top).

610. What is likely to be the chief difficulty in the way of constructing and maintaining a railway in the more sandy parts of Russian Central Asia, and what is likely to be the best means of meeting that difficulty? See pp. 293–4, and comp. p. 25.

611. Describe and explain the contrasts in vegetation in different parts of the Caucasus. Can you mention any parallels in Europe? See p. 295, and comp. pp. 52 (3) (*a*), 254 (near the bottom), 269, 275 (top), with 273 (*n.* 2).

612. Why should the rainfall on the southwestern slopes of the Caucasus be chiefly confined to summer? See p. 295, and comp. pp. 42 and 51 (*b*).

613. What circumstances determine the size of such lakes as Van and Urumia? See p. 295, and comp. pp. 32 (top), and 49 (near the bottom).

614. Where else than in the Caucasus is the chamois to be found? See pp. 296 and 187.

615. Mention some of the chief circumstances that illustrate the isolation of the valley of the Caucasus and the table-lands of Armenia? See p. 296.

616. Mention all the circumstances that give importance to Tiflis.

What towns in northern Italy occupy a similar position? See p. 297, comp. p. 61 (3) (*c*), and p. 272.

617. What are the Cilician Gates? What depression in the heart of Europe has a corresponding importance? What difference is to be noted between the European depression alluded to and the Cilician Gates? See p. 297, and comp. pp. 239–40.

618. Why should the rainfall of Asia Minor be peculiarly scanty within the border mountains? See p. 297, and comp. p. 52 (3) (*a*).

619. In what other part of the Mediterranean region besides Asia Minor is there a plateau noted for its breed of wool-bearing animals, and what are the animals there reared? See p. 297 (bottom), and comp. p. 267.

620. Mention the chief ancient seaports in the west of Asia Minor which have declined in consequence of the silting up of their harbors; name one that has escaped this fate, and explain why it has done so. Can you mention any European port that has had a similar fate to those first referred to? See p. 298 (with *n.* 1), and comp. p. 275 (near the top).

621. Can you mention any European capital situated at an elevation nearly as great as that of Jerusalem? See p. 299, and comp. p. 267.

622. State all the circumstances that give permanent importance to the site of Damascus. Name the chief seaports with which it communicated in ancient times, and that by which these have since been replaced. State how they have come to be superseded. Can you mention any towns in Central Asia that correspond in position with Damascus? If so, state in what respect they correspond. See p. 299, and comp. pp. 61 (3) (*b*) and (*c*), and 294.

623. Explain the form of the name Aleppo, and give other instances of names that illustrate the same thing. See p. 299, and comp. pp. 278 (*n.* 2), and 283 (6).

624. In what respect do all the important towns that have ever existed on the banks of the Tigris agree in situation? What does this circumstance indicate? See p. 301, and comp. p. 60 (near the bottom).

625. Explain the dearth of rain in Arabia, showing why even the border mountains receive only a very small amount. See p. 302, and comp. p. 289 and pp. 40–41.

626. What circumstances give importance to the possession of Aden by the British? See p. 303 and p. 336 (top).

627. Explain the absence of the date-palm from the interior of Irania and its presence in the south and southwest of the region. See p. 304, and comp. p. 333 and p. 52 (3) (*a*). Comp. Question 644.

628. Why should the chief towns of Persia be situated in the immediate neighborhood of the mountains? See p. 305, and comp. p. 52 (3) (*a*).

629. What route is followed by that part of the trade of northern Persia that is not in Russian hands? See p. 305, and comp. p. 296 (near the bottom).

630. How does the Hari Rud end? Can you mention any other rivers that end in the same way and in the same region, and name important towns to which they give existence? See p. 305, and comp. pp. 294 and 288.

631. Where has the only railway as yet constructed in Irania been laid, and for what reason? See p. 305.

II. *The Monsoon Countries and their Dependencies.*

632. Describe the situation and general characteristics of the monsoon countries of Asia. See pp. 289, 42, and 51 (*b*).

633. Explain why so large a proportion of the population of India is gathered in the valley of the Ganges. See p. 306, and consider in your answer not only what is stated on the top of p. 307, but also p. 60 (first half), and p. 311 (second complete paragraph).

634. Mention the more important points of contrast and resemblance between India and Italy. Consider size, situation (in latitude and with relation to the continents to which they respectively belong), surface, communications (external and internal), climate, and products. See pp. 305-9 and 269-71, and table, p. 370.

635. In what respect does the Brahmaputra agree with the Indus and differ from the Ganges? See pp. 306-7, and comp. p. 288 (3).

636. Can you mention any other instances besides the Ghats in which so-called mountain ranges are in reality nothing else than the edges of plateaux? See p. 307, and comp. p. 205 (bottom).

637. What is the Palghat Gap? Mention two important particulars in which it is of importance to India. What general fact is illustrated by one of these particulars? See p. 307, and comp. pp. 308 (bottom), and 52 (3) (*a*).

638. Do you know any other regions besides those referred to on p. 307 which are noted for their rich black soil? Name the characteristic crops of each of the regions alluded to. See pp. 251-2, 292.

639. Explain from the general slope of the Indian Peninsula as indicated by the course of the rivers on which side the greatest extent of lowlands is to be found, and state in what parts of that side you would expect to find the area of lowlands most extensive. See p. 307; comp. p. 27 (last paragraph), and consult Map.

640. Why should the northeast monsoon be a rain-bearing wind for the eastern half of the Peninsula? See p. 308; comp. p. 49 (under Climate), and consult Map.

641. Why should the parts of India mentioned on p. 308 as receiv-

ing specially abundant rains from the southwest monsoon be so favored? See p. 52 (3) (*a*).

642. What would you expect to be the character of the climate of the plateau of peninsular India as regards the amount of its rainfall? See pp. 309 (3), 308, and comp. the account of the climate of the Iberian Peninsula on pp. 263–4.

643. In what part of India must irrigation be invariably necessary for cultivation owing to the deficiency of the rainfall? Why should the rainfall be so deficient in this region? See p. 289.

644. What enables the date-palm to be grown in so high a latitude in the valley of the Indus as is indicated on p. 310, although it will not succeed in the northern half of Persia? See p. 304; comp. p. 306 and p. 52 (3) (*a*).

645. Can you mention any parts of Europe in which a deficiency of roads is made up for in the same way as it is in Bengal? See p. 311, and comp. pp. 249 and 247 (5), comparing with the latter passage p. 240 (below the middle), and p. 241 (near the top).

646. Can you mention any important European cities corresponding in situation to Allahabad? See p. 314, 61 (2) (*a*), and the references under Question 589 on p. 42.

647. Mention the chief circumstances that give importance to the site of Delhi. See p. 314, and comp. p. 61 (*b*) and (*c*).

648. Can you mention any European towns that correspond in situation to Peshâwar? See p. 315, and comp. pp. 233 (1) (*b*), and 272 (*n.* 3).

649. Why should sanitary situations like Simla be situated at great elevations? See p. 315, and comp. pp. 57 and 52 (*b*).

650. (*a*) Mention any seaports you know besides Karáchi which are not situated on the river by whose valley their commerce is fed. (*b*) Why should the foreign commerce of Karáchi be increasing so rapidly as it is? See p. 315, and comp (*a*) pp. 213, 254, 272 (bottom). (*b*) p. 309.

651. How do the physical features of Western India explain the importance of Ahmedabad? Can you name any town in France that occupies a similar situation? See p. 315, and comp. pp. 307 (above the middle of the page), 213 (near the top).

652. From what is stated regarding the situation of Puna, what may be inferred as to the physical features of this part of India as explaining the importance of this town? See p. 315, and comp. p. 60 (middle of page).

653. Why would you expect Puna to be a healthier place for Europeans than Bombay or Calcutta? See p. 315, and comp. p. 307, and Question 649.

654. Mention the three largest towns and chief seaports of India. State which of the three has the greatest natural advantages as a seaport,

the nature of the disadvantages from which the other two suffer, and the modes by which these disadvantages have been remedied. See pp. 314 and 315.

655. Mention some of the chief advantages that India has derived from British rule. See pp. 310 (bottom), 311, 313 (bottom).

656. Mention what European Powers besides Britain have possessions in India. See p. 285.

657. Why is there no large town situated on either side of the strait separating Ceylon from India like Copenhagen on the Sound? See p. 316, and comp. pp. 261 and 260.

658. From the nature of the regions in which rice is chiefly grown, what would you infer to be among the conditions required for the growth of that crop? See pp. 272, 309 (2), comparing p. 308; pp. 316, 320, comparing pp. 49 and 51 (*b*).

659. What fact gives special importance to the portion of Indo-China in British possession? See p. 317, and comp. p. 28 (bottom).

660. Why should there be a larger export of rice from Burma than from Bengal? See p. 317, and the table on p. 313.

661. Can you mention any European towns that have similar commercial advantages to Singapore? Compare the situation of each of the towns alluded to. See p. 318, and comp. pp. 277 (top), 284 and 261.

662. In what parts of the Eastern Archipelago has Dutch influence made itself most felt? What are the chief products of the parts referred to? See pp. 319–21.

663. Why is it natural to find a denser population in China than in Europe taken as a whole? See p. 321, and comp. pp. 251, 256, and table, p. 370.

664. Why is the elevated character of the surface of China not so unfavorable to population in China as it would be in Europe? See p. 324, and comp. p. 256 (with *n.* 3).

665. What two important advantages does China derive from the existence of a mountain barrier on the north? See pp. 289 (first paragraph of small type), and 328 (about the middle of the page).

666. Name an Indian river the navigation of which is impeded in the same way as that of the Hoang-ho. See p. 323, and comp. p. 306.

667. What river in Europe may be compared with the Yang-tse-Kiang as regards the large number of important towns on or near its banks? See p. 323, and comp. p. 223.

668. Why should carriage roads be more abundant in northern than in southern China? See p. 324 (2), and comp. p. 323 (1).

669. Give an account of the climate of northern China, and explain its nature. See p. 325 (4), and comp. pp. 42, 51 (*b*).

670. Compare India and China as to their population (density, origin, governing race). See pp. 322 (bottom), 325, 311, 312, and table, p. 370.

671. What enables China to be almost independent of foreign commerce? See pp. 325–6, and comp. pp. 321, and 323–4.

672. Can you mention any European capital that has a similar situation to Peking? State the particulars in which their situations are similar, and those in which they differ. See p. 326, and comp. pp. 267 and 265.

673. Why should the situation of Tientsin at the northern end of the Grand Canal be of more importance to that town than the fact of its standing on a navigable river open to sea-going ships and to foreign commerce? See Question 671.

674. Explain the importance of Hankau (Hankow) and of Shanghai. See pp. 326 and 327.

675. What is the chief town in tropical China? and mention all the principal circumstances that give importance to it. See pp. 327 and 61, and consult Map.

676. Can you give any reason why so many large towns in the tropical part of southeastern Asia should be situated on a minor arm of a river delta like Canton and Rangoon? See pp. 51 (*b*) and 316 (bottom).

677. Why should Hong Kong be more important, commercially, than Macao? See p. 327, and comp. pp. 192–3 and 265.

678. What physical features in Central Asia may be compared with the Moravian Gate in Europe? Compare all these features with respect to their importance as channels of communication. Consider in your answer the character of the regions that are brought into communication. See p. 328, and comp. pp. 239, 244.

679. Explain the situation of the towns in the Han-hai. See p. 328, and comp. p. 61 (3), and p. 288 (end of first paragraph in large type).

680. Compare Japan and Great Britain, pointing out all the chief resemblances and contrasts. Explain where you can the points of agreement or difference, especially such as are for any reason peculiarly noteworthy. See pp. 329–30, and comp. especially pp. 198–9, 190.

681. Can you mention any part of Europe which, like Japan, derives a fertile soil from the decomposition of volcanic rock? See p. 329, and comp. pp. 206, 275–6.

682. Why should the Japanese fields in winter be green with corn, instead of white with snow? Remember the general character of the summer and winter climate in countries within the monsoon region. See p. 330, and comp. pp. 51 (*b*) and 325 (4).

683. Mention any European town you know that has a similar situation to Kiyoto. State the points of correspondence. See p. 330, and comp. p. 238.

GENERAL QUESTIONS ON ASIATIC COUNTRIES.

684. Give the names and describe the situation of the chief salt lakes in Asia, and state in what regions the greatest number of small salt lakes are to be found. See pp. 288–9, 295, 299.

685. (*a*) Mention the rivers of Asia most important for their navigation, and state what circumstances diminish the importance of other great navigable streams in the continent. (*b*) Mention some of the chief rivers the navigation of which is interrupted by rocky rapids. (*a*) See pp. 306–7, 317, 323, 301, 292 (with *n.* 4). (*b*) See pp. 307, 317.

686. What regions in Asia are specially favored by nature with a fertile soil? Describe the nature of the soil in each case. Name the chief crops grown in the different regions referred to. State in what cases there are drawbacks that diminish the value of this gift of nature, and explain the character of the drawback. See pp. 292, 307 (top); comparing 309 (2), 308 (top), 323, 324, 329.

687. Mention any part of Asia that has a large export of wheat, and mention what seaport has a rapidly growing foreign trade in consequence. See pp. 309 and 315 (5).

688. Mention the products most abundantly grown for export in tropical countries, and describe the situation in which they are grown. State which of these products are even more largely grown outside of the tropics. See pp. 309 (comparing 311), 316, 320–21, and comp. pp. 326 (near the top and near the bottom), 124 and 167. Consult Atlas.

689. Mention the products most largely grown for the food of the natives in tropical Asia. See pp. 309, 319.

690. Mention the chief emigrating races of Asia, and some of the parts of that continent in which they are met with as emigrants, See p. 303 (second paragraph of small type), and comp. pp. 313 (middle), 319, 317 (middle), 318 (near the top), 319 (near the bottom).

691. (*a*) Mention some of the chief towns of Asia that owe their existence to rivers that dry up in the sands; (*b*) any large town situated at or near the confluence of two rivers; (*c*) any important seaports that are situated on river deltas, but not on the main stream belonging to (the delta. (*a*) See pp. 293–4, 299, 305 (near the end in small type), 328 (bottom). (*b*) See p. 314. (*c*) See pp. 313, 317, 327.

692. Mention any towns the importance of which is greatly affected by the position of mountain passes or passes ascending to table-lands. See pp. 297, 299 (two towns), 301, 305, 314 (3), 315 (3 and 5) (comparing Question 652), 328 (bottom).

693. Mention any ancient seaports that have declined through

changes in the coast-line, and state where you can the nature of the change. Name also the seaports which have increased importance at the present day in consequence of these changes. See pp. 298, 299.

See also Questions 5, 21, 22, 23, 29, 30, 46, 48, 49, 55, 57, 58, 60, 92, 105, 110, 120, 142, 167, 185, 209, 257, 695, 744, 762, 774, 797, 814.

AFRICA.

694. What prevents the great African rivers from serving as easy means of communication with the interior of the continent? See p. 382.

695. Contrast the distribution of rainfall in Africa, Europe, and Asia, and explain the differences so far as you can. See pp. 332–3, 335 (middle), 338 (near the top), 342, 345, 184–6, 289, 49, 50 (second paragraph under Climate), 42 and 51 (*b*).

696. Can you mention any part of Africa where the rainfall may be compared to that of the monsoon area of Asia? See p. 345, with the references in *n.* 1.

697. Explain fully how the cold current in the southwest affects the rainfall in the neighboring parts of the interior. See p. 333 and comp. pp. 49–50 (second and third paragraphs under Climate).

698. Why should water be often found underground near the surface in regions where there is little or no water to be seen above ground? See p. 333, and comp. pp. 29 and 49.

699. How is the date-palm peculiarly adapted to the drier parts of Africa? Mention any other parts of the world to which it is also adapted. See p. 333, and comp. pp. 266, 302 (middle of page), 304 (middle of page), 310.

700. Mention some parts of Asia in which durrah is an important grain. By what other name is it known, and where? From the nature of the region in which it is grown, what sort of a climate would you say is required for its growth? See pp. 333, 302, 309 (3).

701. What are the animals most characteristic of Africa, and on what ground would you say that they are characteristic? See p. 333, and comp. p. 58.

COUNTRIES AND REGIONS OF AFRICA.

702. Mention all the circumstances favorable to the early growth of civilization in Egypt, and in particular explain how the inundations of the Nile favored that growth. See p. 335, and comp. pp. 23, 59, 301 (middle of page).

703. Mention any towns you know of that have a similar situation to Cairo. Can you give any reason why such a situation should be considered peculiarly favorable? See p. 336, and comp. 317 and 61 (2) (*a*) and (3).

704. What effect would you expect the Suez Canal to have had on the commerce of European countries relatively to one another? Comp pp. 193 and 273.

705. Why should the Nile have no tributaries below the Atbara? See pp. 335–6.

706. Can you indicate any particular in which the situation of Khartum is analogous to that of Cairo? See p. 337, and comp. Question 703.

707. Can you mention any Asiatic towns similar in situation to Timbuktu? Why is the site of Timbuktu peculiarly well adapted for the kind of trade there carried on? See p. 337, and comp. pp. 299, 314, and 61 (2) (*b*) and (3) (*c*).

708. How do the physical features help to explain the existence of Carthage in ancient times and Tunis in modern times? See p. 338 and consult Map; consider the opportunities for commerce at Tunis and Carthage, and the absence of facilities for commerce in many other parts of the North African coast. See p. 337 (3); comp. also p. 276 and p. 270 (near the bottom).

709. Explain the situation of the Tell in Morocco and Algeria. See pp. 338, 339, and comp. p. 52 (3) (*a*).

710. What would you expect to be the nature of the surface in the parts of Guinea where coffee plantations have been established? Consider in your answer the last sentence of the first paragraph of small type on p. 340, and comp. pp. 309 (end of second paragraph) and 321 (top).

711. How do you account for the desert strip on the coast of Lower Guinea? See p. 341, and comp. the references under Question 697.

712. What peculiarity is to be noticed in the direction of flow of most of the rivers of Cape Colony? How is this peculiarity to be explained? See p. 342, and comp. p. 34 (second paragraph under Mountain-building).

713. What Egyptian city has a site like Yakutsk? See p. 293, and note the bend of the Nile nearest Suakim.

714. Describe and explain the climate of Cape Colony, and in particular explain (*a*) why it should be not so much warmer than that of England as the latitude might lead one to expect, and (*b*) why the interior should be so arid. See p. 342, and comp. (*a*) pp. 47–8; (*b*) p. 52 (3) (*a*).

715. How have the rivers of the Cape Colony served to promote communication between the coast and the interior? See p. 342

the top and near the bottom), and comp. p. 60 (end of first complete paragraph).

716. What product of the Cape Colony indicates a warmer climate than that of England? See p. 342, and comp. p. 190.

717. What differences in climate would you expect to find between Cape Town and Port Elizabeth? See p. 343, and comp. p. 342.

718. What is indicated by such names as Drakenberg? Can you mention any other names that indicate the same thing? See p. 343, and comp. pp. 331, 344.

719. Describe and explain the distribution of products in Natal. See p. 343, and comp. 52 (3) (*b*).

720. (*a*) Explain how the monsoons promoted the development of trade between Arabia and Eastern Africa, as stated on p. 344. (*b*) Why was it natural to choose an island as the centre of this trade? (*a*) Comp. pp. 308 and 42. (*b*) See p. 61 (4).

721. What must Harrar possess in order to serve as the centre of a caravan trade? See p. 345, and comp. p. 333 (near the top).

722. What Asiatic island resembles Madagascar in the character of its surface? Compare the two islands referred to also with respect to size and the distribution of the rainfall. See p. 346, and comp. pp. 316 and 308.

723. How does the fact mentioned on p. 346 show that Madagascar must have been long separated from the mainland of Africa?

See also Questions 30, 89, 129, 143, 167, 208, 727, 731, 733, 736.

AUSTRALIA AND OCEANIA.

Australia.

724. Explain the general character of the wind system and the rainfall in Australia, and in particular explain why the pressure of the air over the land should be relatively high in winter, relatively low in summer, why the east coast strips should be most plentifully supplied with rain, and why summer winds in the south-west should bring less rain than elsewhere. See p. 350, and comp. pp. 38 (near the bottom), 52 (3) (*a*), and top of p. 52 along with Question 697 and the references there given.

725. Can you mention any part of Europe that has a distribution of the rainfall somewhat similar to that of Australia? Contrast the two regions. See p. 350, and comp. pp. 263–4.

726. How do the rivers of Australia illustrate the arid character of the interior? See p. 350–51.

727. What other great island gives evidence of prolonged isolation in the same way as Australia? Compare the two islands in size. See p. 351 (near bottom), and comp. p. 346.

728. What other valuable tree is adapted for dry regions in the same way as the species of eucalyptus? See p. 351, and comp. p. 333.

729. In what respect was Australia even more unfavourably situated than America for the development of civilisation before the arrival of Europeans? See p. 353, and comp. pp. 65–7.

730. From the nature of the surface and the vegetation, what kind of food would you expect to be chiefly consumed by the marsupials? See p. 353, and comp. pp. 58 (bottom), 333.

731. Can you mention any other part of the world besides Australia to which a large population was first brought by the discovery of gold or gems? State which of these regions are best suited for agricultural settlements. See p. 354, and comp. pp. 92, 126, and 342.

732. In what way has it been found possible to improve the condition of parts of the interior of Australia? See p. 358 (near top).

733. Mention some of the principal parts of the world (outside of Europe) in which wool is produced. From the nature of these regions, what sort of climate would you say is best suited for this production? Give reasons for your answer. See pp. 354, 178, 342.

734. State the circumstances that led to the choice of site for the capitals of the chief Australian colonies. Mention one or two parallel instances if you know any. See pp. 355–8, and comp. p. 61.

735. In what respect is the principal coal-field of New South Wales advantageously situated? See p. 356 (consulting Map), and comp. p. 186 (2).

736. What British colony in Africa yields similar products to New South Wales? Compare the two colonies in size and latitude. See p. 356, and comp. p 343; consult Map.

See also Questions 6, 7, 8, 30, 41, 132, 167, 179, 180, 204, 777, 827, 828, 829, 835.

The Australasian Islands.

737. From the character of the straits which separate Australia from Tasmania and New Guinea, would you expect much or little correspondence between the animal and plant life of either of these islands and those of the larger island from which they are separated? Give reasons for your answer. See pp. 363–4 and (*n.* 1), and comp. p. 25 (near the top).

738. What circumstance renders New Guinea less fitted than the south-eastern parts of Australia for the maintenance of a dense popu-

lation, and especially a dense population of European origin? See p. 363, and comp. pp. 57 (under Salubrity), and 59.

739. Can you mention any other kind of dwelling besides pile-dwellings that has been adopted for security? See p. 365, and comp. p. 103.

740. In what part of New Zealand, the North Island or the South Island, are oats likely to be most largely grown? See pp. 360-61.

741. Can you mention any other parts of the world besides New Zealand remarkable for their geysers and other hot springs? State which of these others referred to agrees with the North Island of New Zealand in still possessing active volcanoes. See p. 360, and comp. pp. 261 and 99.

742. What renders Wellington a suitable place to select as the seat of government for New Zealand? See p. 362, consult Map, and compare Question 587.

743. Can you mention an Asiatic Island which produces a fibrous plant used for similar purposes to New Zealand flax? Give the name of this plant and state why it is so called. See p. 362, and comp. p. 321.

See also Questions 809, 835.

Polynesia.

744. Mention some of the tropical plants most remarkable for the amount of food which they furnish in return for a small amount of labor. See p. 366 (*n.* 2), 365 (*n.* 2), 319.

745. Mention the parts of the world you know of in which people believed to belong to the Malay stock are to be found. See pp. 319, 346, 366.

746. What product of the Sandwich Islands is almost entirely exported to the United States? See pp. 368, 124. To the people of which part of the country chiefly is this a benefit? See p. 124.

Antarctic Regions.

747. How do you account for the greater amount of ice in comparatively low latitudes in Antarctic than in Arctic Seas? See p. 368, and comp. p. 47.

748. What proofs are there of the existence of extensive landmasses not yet seen in the Antarctic Regions? Show how the facts mentioned on p. 368 prove that. See pp. 55 and 33.

GENERAL QUESTIONS AND QUESTIONS BASED ON THE INTRODUCTION.

I. MATHEMATICAL GEOGRAPHY.

749. With regard to the first method of proving that the earth is round (p. 16), why is it necessary to take into consideration the fact that objects of the same height come into view on a level surface at the same distance all round? Consider in your answer whether there are any other forms besides that of a sphere that would cause a high object steadily to sink out of sight as it receded from the spectator, or the spectator from it, in any direction.

750. With regard to the second mode of proving that the earth is shaped like a ball (p. 16), can you give any reason why the fact mentioned in the text does not admit of the supposition that the earth is round, but flat, like a penny, or of any other shape? Consider among other things the movement of rotation described on p. 17.

751. Why is it that the fact mentioned in the third mode of showing the form of the earth allows of no other explanation than that given? Consider with reference to this the enormous distance of the heavenly bodies, which is so great as to make the greatest distance between any two points in a straight line on the earth quite inappreciable even at the distance of the sun, which is immeasurably nearer us than any of the fixed stars. As may be deduced from a comparison of p. 16 (*n.* 2) with p. 19 (*n.* 2), and the text to which the notes refer, a distance of 6,000 miles in a straight line on the earth would correspond to only about $\frac{1}{110}$th part of the diameter of the sun.

752. From what is stated on p. 17 regarding the apparent revolution of the heavenly bodies, and the position of the pole star, will that star ever indicate the precise direction in which the north pole of the earth lies, and if so, how often in a day of twenty-four hours?

753. Considering what is stated in the paragraph on pp. 18 and 19, state whether it is before noon or after noon at Paris, Dublin, New York, Berlin, Marseilles, Rouen, Bordeaux, Toulouse, Brest, Madrid, Barcelona, Valencia (Spain), Liverpool, Edinburgh, Dover, Timbuktu Lagos, Cape Town, when it is noon at Greenwich. Consult Atlas.

754. Considering the paragraph referred to in the previous question, and taking the longitude of Honolulu in the Sandwich Islands to be approximately 158° W., and that of Levuka in the Fiji Islands to be approximately 179° E., state what would be the time of day and day of the week and month at each of these places when it was 11 P.M. at Greenwich on Wednesday, August 10, supposing that it was noon at 12 o'clock at each place, that the change of date always takes place at midnight, and that the date at Greenwich determines the date for the whole world. State the length of time that thus appears to elapse between the occurrence of noon at Honolulu and Levuka, and the actual length of the interval in question. Consult the Map, and state what advantage there is in making the date at Greenwich determine the date for the whole world.

755. What interval elapsed between the despatch and publication of a telelgram, dated New York, June 24, 6 P.M., Washington time, and published in London at 6 A.M. on June 25, and what would be the date in Melbourne time of a Melbourne telegram despatched at the same time as the telegram from New York? Washington is (approximately) in long. 77° W.; Melbourne, 145° E.

756. Considering the account given on p. 19 of the revolution of the earth round the sun, state whether a day would be longer or shorter if we reckoned its length by the return of a given fixed star instead of the sun to the same meridian.

757. Is the direction of the movement of the moon round the earth the same as that of the apparent revolution of the sun, or different? See p. 19, and observe for yourselves the position of the moon on two successive nights.

758. Will the sun appear to the north or south of Canton or Havana at midday on June 21, and in which direction will it be seen at Rio de Janeiro at midday on December 21? Comp. p. 20 and note latitudes.

759. How far in degrees will the sun sink below the horizon at midnight on June 21 at Cairo or New Orleans, how far at London, how far at Edinburgh or Moscow, and how far at the north of the Shetland Islands? How far will it sink below the horizon at each of these places on December 21? Note latitudes and comp. p. 20.

760. What is the extreme difference in degrees in the height of the sun at the equator in the course of a year, and what is that difference at any place outside of the torrid zone? At what dates does the sun reach its highest and lowest positions at the equator, and at what dates does it reach these positions at London and Melbourne? See p. 20.

II. PHYSICAL GEOGRAPHY.

Changes and Agents of Change.

761. Can you mention any parts of the world where the facts indicate a former land-connection in places where there are now shallow seas, and where deep channels point to a long-continued isolation of neighboring lands, which is proved in other ways? See p. 25, and comp. p. 182 (small type), p. 346 (*b*), and pp. 287, 363 (foot), 364 (top), and *n.* 1.

762. In what part of the world do we meet with the most extensive and deepest deposits believed to have been brought to their present position by wind? See pp. 25 and 323.

763. Can you mention any parts of the world in which examples of mountains rising with remarkable abruptness from level plains, from the cause stated at the bottom of p. 25 are to be seen, or are likely to be found? See pp. 302 (second paragraph), 344, 101 (2).

764. State generally in what parts of the world the mode of disintegration described on pp. 25–6 (2) is likely to be most operative. Comp. p. 57.

765. How does the fact mentioned on p. 26 regarding the freezing of water explain the fact that ice floats on water?

766. Give some of the most noteworthy examples of which you know of mountain chains or ranges of hills being intersected by river valleys. See p. 26, and comp. pp. 288 (3), 299 (under Damascus), 332 (near the middle), 108, 103 (last paragraph in fine print), 228 (top), 279 (Isker).

767. How does the gritty matter in a rapidly flowing river assist the erosive action of a river, and why should there be more of this matter as a rule in the higher than in the lower part of the course? See p. 27.

768. Why should the current of a river be swifter on the concave than on the convex side of its banks where the course is winding? See p. 27.

769. From the account of the processes described on p. 27 (middle paragraph and *n.* 4), what would you expect to be the nature of the banks of a river where its course is full of windings—rocky or earthy?

Give a reason for your answer. See also p. 28 (second paragraph). Consult Maps for Drave, Theiss, Mississippi, and Menderes rivers.

770. Why is the bed of a river or river-branch in a delta constantly being raised? Can you mention any part of the world where the liability to inundation thus caused constitutes a peculiar danger to a dense population? See p. 28 (top), comp. p. 27, and see p. 215 (foot), 323 (*n.* 3).

771. Why should the sediment of a tributary be deposited at the confluence with the main stream in the precise position indicated on p. 28? Consider what is stated about the middle of p. 27 regarding erosion and deposition.

772. Can you indicate any independent rivers that are likely to have been at one time tributaries of larger streams but to have become independent by the process described at the end of the third paragraph on p. 28? See p. 271 (1), and consult Map.

773. Can you mention any cases in which the utility of a river for navigation is diminished (*a*) by its rapidity, or (*b*) by the occurrence of waterfalls or shallow rapids? (*a*) See pp. 207, 323 (1); (*b*) 323 (*n.* 4), 249 (2), 257 (2), 263, 279, 317 (top), 361, 307 (foot), 332, 86, 88, 115, 120, 171.

774. Mention the four rivers of the world which are of most importance as navigable channels, since they each afford uninterrupted access far into the interior of a continent through a populous country, and mention also the most important of European rivers in this respect. See pp. 306–7, 323, 115–118 (comp. 134), 223.

775. Can you mention any parts of the world remarkable for caves and disappearing rivers due to the cause described on p. 29? See p. 235.

776. Give an account of the origin of medicinal springs, and state why relatively more hot than cold springs are medicinal? See p. 30.

777. Mention any parts of the world you know of in which artesian wells are of peculiar importance, and explain why. See pp. 338, 358.

778. Can you give examples of the different kinds of lakes mentioned on p. 31, or name regions of the earth in which lakes of a particular class are to be found in greater or less number? 1. Lakes that collect various head-waters: see pp. 332, 111, 115. 2. Lakes occurring in the course of a river: see pp. 115, 198 (middle, and see Map), 204, 237, 269, &c. 3. Lakes receiving rivers but having no outlet: see pp. 249, 289, 295, 351, 101. 4. Lakes receiving and giving origin to no rivers: see pp. 250 (below picture), 288 (bottom), 289 (top). In every case consult Map.

779. Can you give any reason why deltas (in the sense of an alluvial deposit originally laid down under water but now traversed by a river or river branches) are more likely to be found at the entrance of rivers

into lakes or inland seas than into the ocean or seas communicating with the ocean? See pp. 31–2. Remember that to form a true delta the matter first laid down under the water must come to appear above the surface of the water, and consider what goes on in a lake of such a nature as to facilitate this emergence of land.

780. P. 32, end of paragraph entitled "General Result of the Action of Water." "Many of the mountains of the world are due as such to no other cause." Why "*as such*?" Mention any examples you know of mountains whose origin is to be explained as here stated in the text. See pp. 103, 230, 307.

781. Can you mention any countries in which the presence of lakes fitted to serve as the regulators of rivers is a noteworthy physical feature? See p. 31 (bottom), and pp. 111, 198, 237, 257. In every case consult Map.

782. Can you give any examples of the extension of the shore-line seaward through the arrest of sea currents? See p. 33, and comp. pp. 304 (second paragraph of small type, comparing the last paragraph on p. 46), 69, 174.

783. What conclusion may we draw as to the size of the earth now as compared with former ages from the facts mentioned on p. 34 as to the present and original condition of the strata of which the crust is composed? Consider what effect it would have on the extent of surface occupied by a piece of cloth if we were to throw it into a number of folds as described on that page.

784. State in what circumstances it would be possible to tell the date in a geological sense at which volcanoes now extinct were in operation and true mountain chains were elevated. See pp. 34 and 35, and comp. bottom of p. 33.

785. Show how the distribution of earthquakes answers to the most probable theories of the causes which in most cases produce them. See pp. 34 and 35.

786. Show how the theory of geyser eruptions mentioned on pp. 36–7 explains the period of rest between the eruptions as well as the eruptions themselves. Bear in mind that the column of water ejected from the geyser crater is cooled by the atmosphere, that much heat is lost by the conversion of water into steam, which takes place very rapidly when water is ejected at a temperature above the boiling-point of water at the pressure of the atmosphere,[1] and that much of the water ejected falls to the ground outside of the crater.

787. Name, or indicate the locality of, some of the mountain chains which, in accordance with what is stated on p. 37 (1), have or have had

[1] It is a law in physics that heat is consumed when a solid passes into a liquid state or a liquid into that of a vapor.

the most serious effect in interrupting communication. Comp. pp. 233, 262, 306.

788. Can you mention any parts of the world where terrace cultivation as described in (3), p. 37, is extensively pursued? See pp. 324, 329.

789. Mention any other fertile plains besides those referred to on pp. 37–8 (5) which owe their fertility to soil washed or otherwise brought down from adjoining mountains. See pp. 95, 206, 221 (2), 283 (6), 293, 329. In every case consult Map.

The Atmosphere.

790. Explain the construction of a mercurial barometer. See p. 38.

791. Supposing the weight of a cubic inch of mercury to be nearly ½lb., what will be the average pressure of the air at sea-level per square inch, seeing that the average height of the barometer at sea-level is nearly 30 inches? See p. 38.

792. Explain the occurrence of land and sea breezes, and show how the fact on which they depend is also illustrated by the trade-winds. See pp. 38–40.

793. Why is there greater rarefaction on the land than over the neighboring sea in that part of South America in the neighborhood of which the trade-winds are observed to become more easterly in their direction? See p. 40, and comp. pp. 38–9 (first paragraph under the heading "Winds").

794. Why does the trade-wind zone, including the belt of calms and variable winds advance northward and retire again southward in the course of the year? See p. 39, comp. the paragraph referred to in last question, and what is stated as to the effect of the altitude of the sun on pp. 21–2.

795. How does a shower of volcanic dust falling as described on p. 40 give evidence of the existence of anti-trade winds at a high altitude within the tropics? Comp. previous paragraph on p. 40.

796. Show how the diagram on p. 39 explains the fact that in a cyclone in the northern hemisphere the winds blow spirally inward in the direction stated in the text on p. 41, and in the southern hemisphere in the opposite direction. Remember that, if the area of low pressure n the centre of the cyclone be taken as the point toward which the wind would blow from all sides directly if the earth were at rest, that diagram shows that in the northern hemisphere all these winds receive, so to speak, a twist to the right, in the southern hemisphere a twist to the left.

797. In what part of the monsoon area described on p. 42 would you expect the summer winds to be most westerly, and the winter winds most easterly? See p. 308, and remember what winds they are that become westerly and easterly respectively in accordance with the normal apparent deflection described and illustaated on pp. 39–40.

The Ocean.

798. State whether you would expect to find relatively salt or relatively fresh surface water in the White Sea, the Sea of Okhotsk, and the Gulf of Mexico, and give the reasons for your answers. See Question 272, with the references there given, and comp. p. 50 (top), 248 (along with 249 (3) under "The Drawbacks of Russian Rivers"), 286 and 69.

799. Is there any part of the ocean between the outer limits of the northeast and southeast trade-winds in which you would expect to find relatively fresh surface water? See p. 42, and end of first paragraph on p. 50.

800. Mention some of the more important seaports of the British Isles and the North Sea which are situated pretty far inland in consequence of the rise of the tide enabling vessels to ascend. See pp. 200–204, 218, 225, and consult Map.

801. Can you mention any other parts of Europe besides those referred to in the text (p. 44) which are remarkable for their high tides, and any that are remarkable for the absence or almost entire absence of tide? See p. 262 (top), and p. 45, comparing 183 (near top).

802. In what position are the sun and moon relatively to one another and to the earth at neap tides? See p. 44.

803. P. 45, end of first paragraph, "the next tidal wave, about twelve and a half hours later." Why so? See p. 43 (near the bottom), and bear in mind that it is the moon more than the sun that governs the tides, and consider the effect which the revolution of the moon around the earth has upon the period when the moon returns to the same meridian as it occupied at a particular time on the night previous.

804. What is indicated by the facts stated in (1) and (2), p. 46, as to the relative weight of warm and cold sea-water? Compare the effect of cold on air, p. 38 (near the bottom), and see also p. 49 (near the top).

805. How do the relations of land and water and the configuration of the sea-bottom protect the ocean in the northern hemisphere to a large extent from such an inflow of cold water from the polar to the equatorial regions as is described on p. 46? Comp. p. 24.

Climate.

806. Explain the difference in the rainfall between the trade-wind region and the belt of calms and variable winds. See pp. 49–50.

807. Mention all the chief effects (direct and indirect) of winds on the physical condition of the globe so far as you are acquainted with them. See pp. 25, 43 (near the bottom), 50, 57 ("The Conditions favorable to Vegetation").

808. Explain why the intervention of mountains prevents the access of rain to regions that would otherwise be plentifully supplied therewith. Can you mention any region visited by monsoon winds from tropical seas, but having its rainfall greatly diminished from the cause indicated? See p. 51, and comp. pp. 52 (3) (*a*), 308, with 309 (3).

809. Give illustrations of the fact that the climate of the southern hemisphere outside of the torrid zone is generally characterized by a lower temperature than in corresponding latitudes in the northern hemisphere. See pp. 48 (first complete paragraph) and 51 (bottom), and pp. 171 (foot), 180 (foot), 342, 361. Consult Atlas.

810. Why should clouds prevail in regions that have a characteristic west coast climate in the temperate zone? See p. 51 (about the middle), and comp. pp. 49–50.

811. Why should the easterly increase in the cold of winter in the temperate parts of Eurasia be more marked than the easterly diminution of the rainfall? See p. 69 and Question 31, with the references there given.

812. Describe the effects of the Humboldt current on the climate of South America. See pp. 48, and 51–2, and comp. p. 171.

813. Give as many examples as you can of the contrasts of climate in the east and west in the temperate zone, along with illustrative facts from the state of vegetation, etc., and state where the contrast between east and west is heightened by the superficial configuration. See pp. 57 (near the middle), 185–6, 190, 208, 292, 350, 353, 361. With regard to the general fact referred to in this question, see p. 51.

814. Give as many examples as you can of regions and districts (*a*) that benefit by the existence of a mountain barrier to shut off cold winds, (*b*) of such as suffer by the absence of such a barrier, and (*c*) of such as suffer by the existence of a mountain or other highland barrier to keep off winds that have a mitigating effect on climate. (*a*) See pp. 184, 213, 254 (near bottom), 269 (middle), 273 (2 and *n.* 2), 289 (end of first paragraph of small type), 295 (second paragraph of small type), 310 (comp. Question 484). (*b*) See pp. 184,279 (bottom), 304, and 75 (3 and *n.* 5), 77. (*c*) See pp. 185–6, comp. p. 256, and p. 85 (end of second complete paragraph), comp. p. 90 (7) and pp. 72–5. With regard to the general fact referred to in this question, see p. 52 (3) (*a*).

815. Give some of the most conspicuous examples of mountains running at right angles to the direction of the prevailing rain-bearing winds, and of plateaux with a border having a similar direction. See p. 72, 171, and comp. pp. 41 and 51 ; also pp. 308 (small type), 350. In every case consult the Map.

816. What series of changes will be brought about by the heating of air through direct contact with the ground ? See p. 52 (3) (*b*) (2), and comp. p 38 (near the bottom).

817. Explain why temperature should as a rule be lower high up on an isolated mountain than on a plateau in the same latitude. See p. 52 (3) (*b*) (2).

818. Can you give any other example besides the Himalayas of mountains in which the snow line is lowered chiefly through the abundance of the snow-fall ? See p. 53, and comp. p. 171 (foot).

819. Mention all the agents of which you know that have a marked effect in wearing away the land ? See pp. 25–6, and 54–5.

820. To what is the turbidness of the stream which usually issues from the foot of a glacier due ? See pp. 54–5.

821. What are the currents by which icebergs must be carried to the lowest latitudes in the North Atlantic and the North Pacific Ocean ? See pp. 56–7, and comp. pp. 47–8.

822. How does the relative freshness of water promote freezing ? Can you give any example besides those mentioned in the text (p. 57) of seas in which freezing is hastened by that cause ? See p. 57, and comp. p. 186.

Vegetation and Animal Life.

823. Can you mention any extensive regions in the temperate parts of the world which were without forests even before they began to be brought under cultivation ? See p. 58, and comp. pp. 240 (along with cut on p. 242), 252 (top), 111, 85.

824. What countries in the world are chiefly remarkable for their forests with fur-bearing animals ? See pp. 251, 292, and 85.

825. What are likely to be the principal articles of export from a region in the temperate zone whose chief wealth consists in forests ? See p. 251 (2), 245 (*n.* 1), 246 (*n.* 1), 113 (*n.* 1).

826. Mention all the circumstances you know of that are characteristic of arid regions in different parts of the world, whether as regards vegetation or in any other respect. See pp. 25, 28 (second paragraph), 31–2, 58–9.

827. Mention any parts of the world in which irrigation is of peculiar importance. See pp. 264, 266, 267, 293, 301, 309, 335, 338, 342, 358, 73.

828. Mention all the modes you know of in which vegetation is specially adapted to arid regions, or regions subject to prolonged droughts. See pp. 58–9, 185, 333, 351–2.

829. Can you name any fodder plants characteristic of a salt steppe and state where they are of peculiar importance? See p. 73 (top), 353 (top).

Man.

830. Can you mention any part of the world in which a dense population existed previously to the construction of good roads, the absence of roads being compensated by the peculiar convenience of the natural waterways? See p. 60, and comp. p. 311.

831. Mention some of the most noteworthy instances with which you are acquainted in which the routes followed by roads have been strictly marked out by the form of the surface? See p. 60, and comp. pp. 233, 239 (bottom), 259 (bottom), 269 (top), 273 (*n.* 2), 308–9, 299 (under Damascus), 305 (middle), 328 (about the middle and at the bottom). See Atlas.

832. Give as many examples as you can of towns whose situation may be referred to the classes named under (1) (*b*), 2 (*a*) (*b*) and (*d*), (4), and (5), on p. 61. Under (1) (*b*): see pp. 199 and 200, 211, 225, 88, 113 (near foot), 357 (middle). Under (2) (*a*): see pp. 210, 222 (fine print and see map), 245, 255 (above middle), 282, 283 (3); 314, 337 (near top), 90 (6), 148 (middle), 150 (below middle), 152 (end of fine print), 155, 161 (near top), and consult Atlas. Under (2) (*b*): see pp. 208 (comp. Question 373), 211 (near the top), 219 (at end of (1) and also of (2)), 227 (middle), etc., consult Atlas. Under (2) (*d*): see pp. 228 (near bottom), 245 (near top), 255 (near top), 275 (middle), 113, 149 (middle), 152 (middle), 154 (near top), 159 (top and foot). Under 4: see pp. 275 (middle), 283 (3), 88 (4). Under 5: see pp. 129, 130, 201, 202 (2), 208, 219 (1), 222, 245, 356 (foot), 363.

833. Mention the most important ship-canals that have been constructed or are now in course of construction through isthmuses, and name the countries to which the isthmuses belong. See pp. 166 (5), (176), 283 (6), 336.

834. What are the chief advantages and disadvantages of the British and Russian possessions outside of Europe? See pp. 84–92, 194–5, 291–6, 305–16, 341, 347–66.

835. Mention the parts of the world most important for the production (*a*) of gold, (*b*) of silver, (*c*) of petroleum. (*a*) See pp. 126, 252, 352–62. (*b*) See pp. 80, 126, 164, 176–7, 222, 241. (*c*) See pp. 130, 295.

See Commercial Index for materials for further questions on commodities (p. 385).

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In the *physical-political* maps, both of America and of other parts of the world, three things have been aimed at as of chief importance; first, the adequate representation of the physical features; second, the careful and somewhat exclusive selection of names; third, the facilitating of comparison as to size between countries and regions included in the different maps.

With regard to the *representation of physical features and*

political outlines and other data, it is of great importance, educationally, to place them on the same map wherever practicable. Thus the correspondence of natural and political boundaries, or its lack, is made plain, and the nature of political subdivisions clearly understood. For illustrations, take California, Alsace-Lorraine, Bohemia or Yunnan. Again, the precise relation of notable towns to outstanding surface features is often of highest interest and importance. A glance at Lyons, Innsbruck, Peshâwar, Bombay, Florence, Vienna, or Mexico on these maps, will show how clearly their position is made apparent.

Their features, physical and political at the same time.

In the *selection of names* it has been the aim to insert no more than is necessary. The atlas is primarily educational, and a multitude of names in a map is not a means of education. Important places are named, and these in large, clear type. That there are other towns is made apparent by using town marks without names, especially in the American maps. The index, moreover, contains a great many more names than are found on the maps. The latitude and longitude being given, their position can easily be found.

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To facilitate *comparison as to size* the maps have all been drawn on one scale or simple fractions of one scale, and, so far as possible, the same scale has been adopted for those parts of the world which it is of most interest to compare together.

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